ENVIRONMENTAL ASSESSMENT
FOR THE
DEMOLITION OF 35 BUILDINGS AND ANCILLARY STRUCTURES
ON
REDSTONE ARSENAL, ALABAMA

U.S. ARMY AVIATION AND MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA

JANUARY 1998

January 30, 1998

**FINDING OF NO SIGNIFICANT IMPACT (FNSI)
FOR THE ENVIRONMENTAL ASSESSMENT FOR THE DEMOLITION
OF 35 BUILDINGS AND ANCILLARY STRUCTURES ON
REDSTONE ARSENAL, AL**

PROPOSED ACTION: The Army proposes to demolish 35 World War II and Cold War Era buildings, covered walkways, and ancillary structures (hereafter referred to collectively as buildings) located on Redstone Arsenal (RSA), Alabama. Some of these buildings have been abandoned for some time and are considered to be in excess of Army needs. Many of these buildings contain asbestos and lead-based paint, and have outdated plumbing, electrical, and HVAC systems that would make renovation of the buildings cost prohibitive. The buildings would be razed by conventional demolition methods.

BACKGROUND: Redstone Arsenal is located in Madison County, southwest and adjacent to the city of Huntsville, Alabama. The Arsenal occupies approximately 38,000 acres of land and employs approximately 21,500 government and contractor personnel. Approximately 2,000 buildings are currently located on RSA. The Army has identified 35 buildings for demolition. The buildings proposed for demolition were used for various administrative, storage, and housing needs. All of the buildings identified for demolition are considered excess to current military needs.

PURPOSE OF THE PROPOSED ACTION: The purpose of the proposed building and structure demolitions is to remove buildings considered to be in excess of current Army needs and to remove potential health and safety hazards posed by the presence of asbestos and lead-based paint. The buildings are considered to be unsuitable for renovation. This Proposed Action would return the areas currently occupied by these buildings to a more useable status.

NEED FOR THE PROPOSED ACTION: Redstone Arsenal requires ample area to accommodate new development and growth for installation needs and mission requirements, and an obligation to provide a safe environment for installation personnel. Removal of the buildings identified in the Proposed Action would allow room for the reutilization of these locations in some of the prime building locations within the Arsenal. If the areas are not to be immediately utilized for building needs the areas would be available for revegetation and returned to a more naturalized condition for use by local wildlife populations, and to enhance the aesthetic value of the areas currently occupied by the unused buildings that are in a state of disrepair.

ALTERNATIVES CONSIDERED: Alternatives to the Proposed Action considered were the No-Action Alternative and the Selective

Demolition Alternative. Under the No-Action Alternative, the Arsenal would not demolish the identified buildings, which would have a detrimental effect on land use and health and safety issues on the Arsenal. The No-Action Alternative was not considered viable, since potential negative impacts would be expected as the buildings continue to deteriorate. The Selective Demolition Alternative would allow the demolition of selected buildings which present the worst health and safety concerns while retaining buildings that might be renovated in a cost effective manner to extend their useful function. Renovation of these buildings is not considered a viable alternative due to the existing issues with asbestos, lead-based paint, and outdated electrical, plumbing, and HVAC systems.

ENVIRONMENTAL EFFECTS: Eleven broad environmental components were considered to provide a context for understanding the potential effects of the Proposed Action and a basis for assessing the significance of potential impacts. The areas of environmental consideration are air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources.

There would be potential positive impacts anticipated to land use, health and safety, and socioeconomics as a result of demolition of the buildings as prescribed under the Proposed Action. Mitigation measure(s) identified for these actions, where applicable, are included in Chapter 5, Conclusions and Mitigations Summary.

CONCLUSION: The Proposed Action would optimize facility operations and allow better land use and decrease health and safety concerns of some of the buildings on the Arsenal and surrounding areas. We found no significant environmental impacts associated with this action which would require the publication of an Environmental Impact Statement.

DEPARTMENT OF THE ARMY
UNITED STATES ARMY AVIATION AND MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA

FINDING OF NO SIGNIFICANT IMPACT FOR THE DEMOLITION OF 35 BUILDINGS AND ANCILLARY STRUCTURES ON REDSTONE ARSENAL, ALABAMA

PREPARED JANUARY 1998

PROPONENT OF THE ACTION:

_____Date_____

JOE L. DAVIS
Chief, Master Planning Division

PREPARED BY:

_____Date_____

MARK D. BURROUGHS
Master Planning Division

REVIEWED BY:

_____Date_____

AMY MEREDITH
Attorney Advisor

APPROVED BY:

_____Date_____

JERRY M. HUBBARD
AMCOM Environmental Officer

REVIEWED BY:

_____Date_____

DANIEL J. DUNN
Environmental Protection Specialist
Environmental Management Office

REVIEWED BY:

_____Date_____

CAROLENE WU
NEPA Coordinator
Environmental Management Office

REVIEWED BY:

_____Date_____

ROBERT J. SPAZZARINI
AMCOM Chief Counsel

FINAL APPROVAL BY

_____Date_____

EMMITT E. GIBSON
Major General, USA
Commanding

EXECUTIVE SUMMARY

INTRODUCTION

Redstone Arsenal (RSA) is located in Madison County, southwest and adjacent to the city of Huntsville, Alabama. Prior to acquisition by the Army, the land comprising the present day Arsenal was primarily used for producing cotton, corn, hay, small grain crops, and livestock. The original land was purchased in 1941-42 from 320 landowners under the Siebert Arsenal Project. Redstone Arsenal began as three contiguous facilities, Huntsville Arsenal, the Gulf Chemical Warfare Depot (GCWD), and the Redstone Ordnance Plant. These three facilities were constructed to manufacture, assemble, and store chemical munitions. Huntsville Arsenal, the GCWD, and the Redstone Ordnance Plant were eventually combined in 1949 into the current RSA with approximately 32,000 combined acres. Over the years, acreage has increased and decreased during various transactions. RSA currently comprises 37,910 acres (including special-use permit land) located on an approximately six mile wide by ten mile long site. (U.S. Army Missile Command, 1995)

DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action is to demolish 35 World War II and Cold War era buildings and structures (hereafter referred to collectively as buildings) located in various locations across RSA. The Proposed Action is to demolish buildings found to be in excess of Army needs and in some cases pose human health and safety hazards.

The Proposed Action also includes the demolition of segments of covered walkways on the Redstone Arsenal Rocket Engine (RARE) facility located in the southeast portion of RSA. The walkways cannot be demolished until section 106 of the NHPA process is done on Lines 1, 2, and 3 of the RARE Facility. This would include the removal of transite roofing and siding before the proposed demolition activities occur. More detailed information about this area of RSA is contained in the *Environmental Assessment for the Demolition of Buildings and Ancillary Structures on the Redstone Arsenal Rocket Engine Facility, January 1998*.

ALTERNATIVES CONSIDERED

Alternatives to the Proposed Action considered were the No-Action Alternative and the Selective Demolition Alternative. Under the No-Action Alternative, the Arsenal would not demolish the identified buildings, which would have a detrimental effect on land use and health and safety issues on the Arsenal. The No-Action Alternative was not considered viable, since potential negative impacts would be expected as the buildings continue to deteriorate. The Selective Demolition Alternative would allow the demolition of selected buildings which present the worst health and safety concerns. Renovation of these buildings is not considered a viable alternative due to the existing issues with asbestos, lead-based paint, and outdated electrical, plumbing, and HVAC systems. Because of these reasons the Selective Demolition Alternative was rejected as a viable alternative to the Proposed Action.

METHODOLOGY

This Environmental Assessment (EA) analyzes the potential environmental consequences of the Proposed Action in compliance with the National Environmental Policy Act (NEPA); Department of Defense Directive 6050.1, Environmental Effects in the United States of Department of Defense Actions; and Army Regulation 200-2, Environmental Effects of Army Actions.

Eleven environmental components were considered as a basis for assessing the significance of potential impacts. These areas are air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources.

To assess the significance of environmental impacts, a list of activities necessary to accomplish the Proposed Action was developed. The environmental setting was described and activities with the potential for significant environmental consequences were identified. Three levels of impacts were considered: no impact, no significant impact, and significant impact.

RESULTS

This section summarizes the analyses for each of the 11 areas of environmental consideration.

AIR QUALITY - There would be no significant impacts to air quality anticipated from building demolition activities under the Proposed Action or the Selective Demolition Alternative. Activities during demolition would produce short-term, intermittent air quality impacts from fugitive dust (particulate matter). However, Federal and state National Ambient Air Quality Standards (NAAQS) concentrations would not be expected to be exceeded. Fugitive dust would be controlled, and such emissions are not expected to contribute to the long-term impacts on air quality of the area. Mitigation measures, which are described in detail in Chapters 4 and 5, consist primarily of minor operational restrictions which would be implemented with the Proposed Action.

BIOLOGICAL RESOURCES

Vegetation - All of the buildings under consideration for removal are located in areas previously disturbed by construction. The existing vegetation is primarily landscape trees, shrubs, and sod. The Arsenal does not plan to remove existing large vegetation (*i.e.* trees) from areas around the buildings proposed for demolition, if such action can be avoided. Further, the Arsenal plans to revegetate the areas to sod and/or trees when the demolition and removal activities are completed. These actions would result in positive impacts to biological resources from the Proposed Action or the Selective Demolition Alternative. Under the No-Action Alternative, no impacts to biological resources would be anticipated.

Fish and Wildlife - A variety of wildlife species are found on the Arsenal. Some of these species have the potential to be found in and around the areas slated for demolition. With the exception of some common bird and small mammal species, these areas do not currently provide suitable habitat or nesting/den locations for many species. No fishery resources are located in the vicinity of the buildings designated for possible demolition in the Proposed Action or the Selective Demolition Alternative. Under the No-Action Alternative, no impacts to these resources would be anticipated.

Aquatic Habitats - No significant aquatic habitats exist in the vicinity of the buildings designated for demolition. Neither the Proposed Action, nor the No-Action Alternative would be expected to impact any aquatic habitats or organisms.

Threatened and Endangered Species - Redstone Arsenal has been surveyed for threatened and endangered species and some species are present. However, the areas impacted by the demolition activities do not have suitable habitat for listed or candidate species, and no species are present in

the demolition areas. There is a small population of Price's Potato-Bean (*Apios priceana*), Federally listed as threatened, located near one of the buildings proposed for demolition. The location of the population of this threatened species is known to Installation Natural Resources personnel, and contractor activity during the proposed demolition of the nearby building will be closely monitored during demolition activities to ensure there are no impacts to the population. Implementing the Proposed Action or the No-Action Alternative would have no impact on threatened or endangered flora or fauna at RSA, or their habitats.

Unique Habitats - Redstone Arsenal has been surveyed and unique ecological areas have been identified. No unique habitats occur in the vicinity of the buildings designated for demolition. Neither the Proposed Action nor the No-Action Alternative would be expected to impact these resources.

CULTURAL RESOURCES - There would be no significant impacts to cultural resources from demolition of the buildings listed from the Proposed Action. With the exception of the walkways in the RARE Facility, the buildings addressed in this EA have been determined not eligible for the National Register of Historic Places (NRHP). RSA has consulted with the Alabama State Historic Preservation Office (ALSHPO) and asked for their concurrence that these buildings are not eligible for the NRHP and the determination of no effect to historic properties. Mitigative measures required for several of the proposed buildings are being coordinated with the ALSHPO and the Advisory Council on Historic Preservation (ACHP) for their concurrence. There would be potential negative impacts to cultural resources under the No-Action Alternative, since there would be no clearly defined plan for the restoration or maintenance of any of the buildings under consideration for demolition.

HAZARDOUS MATERIALS AND WASTE - All of the buildings under consideration for demolition have been vacant for some time. Since all of the buildings were constructed 40-50 years ago most of them still contain asbestos and/or lead-based paint. No attempts to remove these materials have been made since the buildings were vacated; however, the first step in the demolition process will be to remove all asbestos-containing material from the buildings and properly dispose of this material prior to demolition. No significant impacts from hazardous materials and waste would be expected from the Proposed Action provided mitigative measures, that mostly concern the proper disposition of demolition waste, are implemented. Potentially negative impacts from hazardous materials and waste would result from the No-Action Alternative. The No-Action Alternative would place a burden on the Arsenal to maintain these structures or secure them from the public to avoid liability from the hazards contained within. If the No-Action Alternative is chosen, the asbestos would still be removed from the buildings and disposed of.

HEALTH AND SAFETY - No significant impacts to health and safety from the Proposed Action are anticipated provided mitigative measures are implemented. These measures consist primarily of operational issues to protect human health and the environment, and are detailed in Chapters 4 and 5 of this EA. By contrast, there would be potential negative impacts to health and safety under the No-Action Alternative, if the buildings under consideration are not demolished.

INFRASTRUCTURE AND TRANSPORTATION - There are no impacts anticipated to infrastructure and transportation from implementation of the Proposed Action or the No-Action Alternative. There are no utility requirements expected for demolition activities and the Arsenal's existing roadway network is expected to provide suitable access to the proposed demolition sites throughout the Arsenal.

LAND USE - There would be positive impacts anticipated to land use under the Proposed Action. The land currently occupied by the buildings considered for demolition would be available for alternative uses. Demolition of the buildings would help optimize long-term land use on the Arsenal, consistent with good management practices and a long-range planning perspective. The No-Action Alternative would have potential negative impacts to land use. The No-Action Alternative would place a burden on the Arsenal to maintain these structures or secure them from the public to avoid liability from the hazards contained within.

NOISE - There would be brief periods of noise impacts anticipated from the Proposed Action. However, these impacts would not be considered significant. Demolition activities would generate noise during periods of demolition, which although not continuous, could be disruptive for brief periods. Buildings currently identified for demolition are not adjacent to sensitive noise receptors (such as threatened or endangered species, hospitals, or schools). There would be no impacts to noise under the No-Action Alternative.

GEOLOGY AND SOILS - There would be no impacts anticipated to the geology or soils from the Proposed Action or the No-Action Alternative.

SOCIOECONOMICS - The buildings under consideration for demolition have been abandoned for some time and do not currently contribute to the socioeconomic base of the Arsenal. The Proposed Action to demolish the buildings is expected to have a positive impact on local socioeconomics. A number of job opportunities, from pre- and post- demolition activities would be anticipated from the Proposed Action. Incidental positive impacts to socioeconomics associated with future construction projects would be expected and evaluated under separate environmental documentation for those projects. No impacts to socioeconomics from the No-Action Alternative would be anticipated.

WATER RESOURCES - No impacts to water resources are anticipated under the Proposed Action or the No-Action Alternative. Demolition activities would be performed in a manner and under conditions that would ensure that soil erosion from the demolition sites is minimized and does not run off to drainage ditches and impact water resources if the Proposed Action is implemented.

CONCLUSION

Redstone Arsenal proposes to demolish 35 World War II and Cold War Era buildings. These buildings have been abandoned for some time and are in various states of disrepair. Additionally, some of the buildings have the potential to contain asbestos and lead-based paint. To reduce health and safety liability issues and to free up the areas for current and future mission needs, the buildings need to be removed. This document may assist in tiering future environmental documents, such as Records of Environmental Consideration (RECs), as additional buildings are identified for demolition.

No significant impacts are anticipated from implementing the Proposed Action. There would be positive impacts anticipated to land use, health and safety, and socioeconomics. Mitigation measures have been identified for air quality, cultural resources, hazardous materials and waste, geology and soils, and health and safety.

Under the No-Action Alternative, the Arsenal would continue to monitor and maintain the buildings in their current state. The No-Action Alternative was not considered viable, since

potential negative impacts would be expected to land use and health and safety as the buildings continue to deteriorate.

LIST OF ACRONYMS AND ABBREVIATIONS

AAC	ADEM Administrative Code
ACGIH	American Conference of Governmental Industrial Hygienists
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-Containing Material
ADEM	Alabama Department of Environmental Management
ALNHP	Alabama Natural Heritage Program
ALSHPO	Alabama State Historic Preservation Office
AMCOM	U.S. Army Aviation and Missile Command
AR	Army Regulation
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CWA	Clean Water Act
CWS	Chemical Warfare Service
dB	Decibels
dBA	A-weighted Decibels
DA	Department of the Army
DoD	Department of Defense
DOT	Department of Transportation
EA	Environmental Assessment
EPA	Environmental Protection Agency
GCWD	Gulf Chemical Warfare Department
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HAP	Hazardous Air Pollutant
HAZMAT	Hazardous Waste Material Handling
HCl	Hydrochloric Acid
HSB	Huntsville Spring Branch
IAW	In Accordance With
ICUZ	Installation Compatible Use Zone
MICOM	U.S. Army Missile Command
MSFC	Marshall Space Flight Center
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	Nitrogen Oxide
NO_x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OMMCS	Ordnance and Missile Munitions Center and School
OSHA	Occupational Safety and Health Administration
O_3	Ozone

Pb	Lead
PM-10	Particulate matter with aerodynamic diameter less than or equal to 10 microns
RACM	Regulated Asbestos-Containing Material
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
ROI	Region of Influence
RSA	Redstone Arsenal
RTTC	Redstone Technical Test Center
SARA	Superfund Amendments and Reauthorization Act
SCS	Soil Conservation Service
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SMF	Smoke Munitions Filling
SO_2	Sulfur Dioxide
SSHP	Site Safety and Health Plan
SWDF	Solid Waste Disposal Facility
TLV	Threshold Limit Value
TVA	Tennessee Valley Authority
USDA	Unites States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USSR	Union of Soviet Socialist Republics
WNWR	Wheeler National Wildlife Refuge

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

1.0 PURPOSE OF AND NEED FOR ACTION

The National Environmental Policy Act (NEPA); Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); Department of Defense (DoD) Directive 6050.1, *Environmental Effects in the United States of Department of Defense Actions*; and Army Regulation (AR) 200-2, *Environmental Effects of Army Actions*, which implement these laws and regulations, direct DoD and Army officials to consider environmental consequences when authorizing or approving Federal actions. This Environmental Assessment (EA) analyzes the environmental consequences of the demolition of 35 buildings on Redstone Arsenal (RSA).

Section 1.0 of this document discusses the background and briefly describes the Proposed Action, introduces the purpose of and need for the action, notes the location(s) of the project, and highlights issues raised during the assessment process. Section 2.0 discusses project alternatives, including the Proposed Action. Section 3.0 describes the affected environment at the location(s) of the Proposed Action. Section 4.0 assesses the potential environmental consequences of implementing the Proposed Action and alternatives and highlights impacts and mitigation measures for each resource. Section 5.0 presents the conclusions of the assessment and a recap of the mitigation measures for selected resources. Section 6.0 lists preparers for this EA. Section 7.0 lists individuals and agencies consulted and the agencies, organizations, and individuals sent copies of the EA. Section 8.0 lists references used to prepare this document.

References for this document are presented in three ways. References presented after a period refer to the preceding paragraph. References presented before a period refer only to the information in that sentence. References presented within a sentence refer specifically to the fact they follow.

1.1 DESCRIPTION OF THE PROPOSED ACTION.

The Proposed Action is to demolish, in place, 35 World War II and Cold War Era buildings located in various areas on RSA (Figures 1-1 through 1-14). Some of these buildings have been abandoned for some time, are considered to be in excess of current Army needs, and several are known to contain asbestos and lead-based paint. The buildings and walkways would be razed by conventional demolition methods following appropriate asbestos abatement procedures.

The Proposed Action also includes the demolition of segments of covered walkways on the Redstone Arsenal Rocket Engine (RARE) facility located in the southeast portion of RSA. This would include the removal of transite roofing and siding before the proposed demolition activities occur. More detailed information about this area of RSA is contained in the *Environmental Assessment for the Demolition of Buildings and Structures on the Redstone Arsenal Rocket Engine Facility, January 1998*.

1.1.1 Background. Redstone Arsenal is located in Madison County, southwest and adjacent to the city of Huntsville, Alabama. Prior to acquisition by the Army, the land comprising the present day Arsenal was primarily used for producing cotton, corn, hay, small grain crops, and livestock. The original land was purchased in 1941-42 from 320 landowners under the Siebert Arsenal Project. Under this project, Redstone Arsenal began as a Chemical Warfare Service (CWS) facility, Huntsville Arsenal. Eventually the CWS arsenal, Huntsville Arsenal, was joined by the Gulf Chemical Warfare Depot (GCWD), under the CWS and the Redstone Ordnance Plant, under the Ordnance Department. Later, the GCWD was separated from the activities of

Huntsville Arsenal, although it remained under the command of Huntsville Arsenal. Therefore, RSA began as three contiguous facilities, Huntsville Arsenal, the GCWD, and the Redstone Ordnance Plant. Huntsville Arsenal manufactured a wide range of toxic chemicals, incendiaries, smoke munitions, and protective clothing. The Redstone Ordnance Plant assembled chemical ammunition manufactured at Huntsville Arsenal. The GCWD had the mission of handling chemical ammunition and toxics for zone distribution, shipment to ports of embarkation, and reserve storage.

In January of 1943, the Redstone Ordnance name was changed to Redstone Arsenal. After VJ Day, activity at RSA slowed rapidly until production ceased on August 17, 1945. In 1947, RSA was placed on standby but in 1949 the Chief of Ordnance reactivated RSA to serve as the center for research and development in the field of rocketry. At that time, Huntsville Arsenal and the GCWD were absorbed by RSA and became one facility with approximately 32,000 combined acres. Over the years, acreage has increased and decreased during various transactions. RSA currently comprises 37,910 acres (including special-use permit land) located on an approximately six mile wide by ten mile long site. (U.S. Army Missile Command, 1995)

Over the past several years a number of buildings on RSA have become excess to Army needs and/or are not considered feasible for renovation. Several of these buildings are known to contain asbestos and lead-based paint.

1.1.2 Purpose of the Action. The purpose of the proposed building demolitions is to remove a potential health and safety hazard posed by the buildings identified. The Proposed Action would raze structures which are considered to be unsuitable for renovation and in excess of Army needs. This Proposed Action would return the areas currently occupied by these buildings to a more useable status. Those buildings which contain asbestos would have the asbestos removed prior to the demolition of the building.

1.1.3 Need for the Action. Redstone Arsenal requires ample area to accommodate new development and growth for installation needs and mission requirements, and an obligation to provide a safe environment for installation personnel. Removal of the buildings identified in the Proposed Action would allow room for the reutilization of these locations in some of the prime building locations within the Arsenal. If the areas are not to be immediately utilized for building needs, the areas would be available for revegetation and returned to a natural condition for use by local wildlife populations, and to enhance the aesthetic value of the areas currently occupied by the unused buildings that are in various states of disrepair.

1.1.4 Location. The buildings slated for demolition are located in various areas throughout RSA, see Figure 1-1 - Figure 1-14.

1.2 RELATED ENVIRONMENTAL DOCUMENTATION.

- *Architectural Assessment of the World War II Military and Civilian Works, U.S. Army Missile Command, Redstone Arsenal, Madison County, Alabama.* March 1997.
- *Draft Architectural and Historic Inventory of Buildings and Structures Dating to the Cold War-Era (1946-1989) at Redstone Arsenal, Alabama*. August 15, 1997.

1.3 AGENCIES INVOLVED IN ENVIRONMENTAL ANALYSIS.

The Alabama State Historic Preservation Office (ALSHPO) and the Advisory Council on Historic Preservation (ACHP) have been consulted to determine their concerns regarding the Proposed

Action (Appendix A). In addition, the U.S. Fish and Wildlife Service (USFWS) has been consulted to determine their concerns regarding the Proposed Action (Appendix A).

1.4 PUBLIC INVOLVEMENT.

There will be a 30-day comment period after the Notice of Availability of the EA for the Demolition of Buildings and Structures on RSA is published in the local newspaper. Other Federal, state, and local agencies are not currently involved in the planning of this action.

There were no significant environmental issues determined through this EA process which would result in the need for an Environmental Impact Statement. All issues raised during the scope of the process have been identified within this assessment.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 SUMMARY OF ALTERNATIVES.

During the planning stage for the Proposed Action, the No-Action Alternative and the Selective Demolition Alternative were considered and retained. These alternatives, as well as the Proposed Action, were assessed for potential impacts to the environment and described in the following sections.

2.2 DESCRIPTION OF ALTERNATIVES INCLUDING THE PROPOSED ACTION.

2.2.1 Alternative 1 - Proposed Action. The Proposed Action is to demolish in-place 35 World War II and Cold War Era buildings located on RSA, Alabama. These buildings have been abandoned for some time and several are known to contain asbestos and/or lead-based paint. The buildings would be razed by conventional demolition methods after the asbestos-containing materials (ACM) have been removed. Representative photos showing the condition of the buildings to be demolished throughout the Arsenal is shown in Figures 2-1 through 2-7.

The Proposed Action also includes the demolition of segments of covered walkways on the Redstone Arsenal Rocket Engine (RARE) Facility located in the southeast portion of RSA. This would include the removal of transite roofing and siding before the proposed demolition activities occur. More detailed information about this area of RSA is contained in the *Environmental Assessment for the Demolition of Buildings and Ancillary Structures on the Redstone Arsenal Rocket Engine Facility, January 1998*.

2.2.2 Alternative 2 - No-Action Alternative. Under the No-Action Alternative, the Arsenal would not demolish the identified buildings. This would have a detrimental effect on land use and health and safety on the Arsenal. The No-Action Alternative was not considered viable, since potential negative impacts would be expected to land use and health and safety and the buildings would continue to present a hazard as they continue to deteriorate.

2.2.3 Alternative 3 - Selective Demolition. The Selective Demolition Alternative would allow the demolition of selected buildings containing asbestos and lead-based paint that present the worst health and safety concerns while retaining buildings that might be renovated in a cost effective manner to extend their useful function. These buildings do not meet current building code standards in many cases and it is not economically feasible to renovate these structures. In other cases, the use of the surrounding area precludes another use for some structures. Renovation of these buildings is not considered a viable alternative for these reasons in addition to existing issues with outdated electrical, plumbing, and HVAC systems in the buildings.

Figure 2-1
Old Courthouse Building Proposed for Demolition

Figure 2-2
Building 136 Proposed for Demolition

Figure 2-3
Building 3435 Proposed for Demolition

Figure 2-4
Building 3490 Proposed for Demolition

Figure 2-5
Building 4810 Proposed for Demolition

Figure 2-6
Building 5675 Proposed for Demolition

Figure 2-7
Building S-8014 Proposed for Demolition

3.0 AFFECTED ENVIRONMENT

This section describes the environment potentially affected by the Proposed Action. The affected environment is described to provide a context for understanding potential impacts. Components of the affected environment that are of greater concern are described in greater detail.

Available literature was acquired and reviewed. To fill data gaps and verify and update available information, RSA personnel as well as Federal, state, and local regulatory agencies were contacted. Cited literature, telephone interviews, and referenced materials are presented in Chapter 8.

Eleven broad environmental components were considered to provide a context for understanding the potential effects of the Proposed Action and as a basis for assessing the significance of potential impacts. Several of these environmental components are regulated by Federal and/or state environmental statutes, many of which set specific guidelines, regulations, and standards. These standards provide benchmarks for determining the significance of environmental impacts. The areas of environmental consideration are air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources.

3.1 AIR QUALITY

Region of Influence (ROI) - The ROI for the Proposed Action is the area occupied by the building itself, since the buildings under consideration for demolition are located throughout the entire Arsenal.

Affected Environment - Existing air quality is determined through examination of air quality standards. Air quality standards are established and maintained through both state and Federal programs to protect human health and welfare. The purpose of this chapter is to identify those state and Federal programs that regulate maintenance of air quality in the area around RSA that would potentially be affected by demolition operations. The section is divided into two parts. Part 1, presented below, addresses air quality standards potentially applicable to the proposed demolition of buildings at RSA. Part 2 discusses regulatory requirements and work practice standards that must be adhered to during demolition activities in order to maintain compliance with air quality standards. This information is presented in Chapter 4, Section 4.1.

3.1.1 Regulatory Overview

This regulatory overview addresses state and Federal air regulations potentially applicable to the proposed demolition of buildings at RSA located in Huntsville, Alabama. Some of the buildings contain asbestos and lead-based paint.

The Clean Air Act (CAA) of 1970 and the Clean Air Act Amendments (CAAA) of 1990 authorize the Environmental Protection Agency (EPA) to develop programs for the control and abatement of air pollution from the construction, reconstruction, or modification of air emission sources of regulated pollutants. The emphasis of these programs is to protect public health and welfare through maintenance of air quality standards for air pollutants.

EPA delegates much of its authority to administer regulations to the states, who in turn, are responsible for developing State Implementation Plans (SIP) for the maintenance of air quality. EPA has ultimate authority to approve or disapprove these plans, based on their adherence to

Federal statues. ADEM is the environmental regulatory authority for the State of Alabama. ADEM has adopted Federal regulations into the ADEM Administrative Code (AAC) Division 315-3.

The CAA established National Ambient Air Quality Standards (NAAQS) for criteria pollutants. (Those for which health-based standards have been developed -- carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxides (NO_x), and particulate matter less than 10 microns (PM10), ozone (O_3), and lead (Pb). ADEM has incorporated NAAQS into AAC Division 315-3 Chapter 1 (AAC 315-3-1). The city of Huntsville is in attainment for all criteria pollutants for which NAAQS have been established.

For air pollutants other than criteria pollutants, the State of Alabama has adopted guidelines for new air emission sources such that the emission of a substance should not cause ambient air concentrations (on public property) to exceed $1/40^{th}$ of the published threshold limit value (TLV) as published by the American Conference of Governmental Industrial Hygienists (ACGIH). ADEM can require those pollutant emissions from newly constructed, reconstructed or modified emission sources be analyzed to compare impacts to the fractional TLV's.

The CAA also requires EPA to adopt National Emission Standards for Hazardous Air Pollutants (NESHAPs) that may adversely affect public health. There are 189 HAPs that are currently subject to the regulations. NESHAP applies to any major source of HAPs engaged in either aerospace manufacturing or reworking operations. The CAA defines a major source as any facility with the potential to emit 10 tons or more per year of any one of the 189 HAPs listed in the CAA; or 25 tons or more per year of any combination of HAPs listed in the CAA. ADEM has adopted NESHAP regulations in AAC 315-3-11.

3.2 BIOLOGICAL RESOURCES

Region of Influence - The ROI for biological resources is the land currently occupied by the buildings proposed for demolition. The buildings are dispersed across the Arsenal.

Affected Environment - RSA is a single tract of land encompassing approximately 38,000 acres and is diverse in both topography and flora and fauna. Elevations range from approximately 570 feet above mean sea level (msl) in bottomlands to 1,200 feet msl in the mountainous regions of the Arsenal. Forest lands, rights-of-way, test areas, old-fields (abandoned open areas) in various stages of plant succession, in addition to developed areas, creeks, sloughs, and ponds provide abundant diversity in wildlife and fishery habitat on the Arsenal. Approximately one-third of RSA lies within the 100-year flood plain of the Tennessee River (U.S. Army Missile Command, 1994). This habitat diversity provides for greater fish and wildlife species diversity.

This section describes the biological resources of the areas currently occupied by the buildings proposed for demolition by major biotic habitat. Information in this section comes from existing documentation and has not been completely field verified. Even though no exhaustive inventory of the flora and fauna of RSA has been done, the Alabama Natural Heritage Program (ALNHP) conducted a biological inventory of the Arsenal to determine the presence or potential presence of Federally listed and state tracked rare species of plants and animals (ALNHP, 1995). A summary table of ecological resources is also available in Appendix F of the *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation* (U.S. Army Missile Command, 1994). The *Natural Resources Management Plan for Redstone Arsenal* (U.S. Army Missile Command, 1995) and the *Environmental Assessment of the Natural Resources Management Plan for Redstone Arsenal* (U.S. Army Missile Command, 1997a) are used as tiering documents for many of the resources described below.

Vegetation - A variety of native vegetation communities exists on RSA and Wheeler National Wildlife Refuge (WNWR) (approximately 4,000 acres of which are located on the Arsenal). A comprehensive listing of native vegetation within RSA boundaries is found in Appendix B of the *Natural Resources Management Plan for Redstone Arsenal*. Specific discussion of the vegetation resources for the ROI for this document is included below.

Three primary ecological units make up RSA: upland forests, grasslands, and wetlands. Upland forests consists of lands at elevations above approximately 570 feet msl. Grasslands are generally leased agricultural lands and also are usually above an elevation of approximately 570 feet msl. Wetland areas consist of permanently and occasionally inundated land and associated areas. These areas are primarily controlled by the TVA Wheeler Dam flood control program and secondarily impacted by other factors including beaver activity.

Upland forest land consists of pine plantations, mixed hardwood and pine, and hardwood forests. These forests contain deciduous and evergreen trees including loblolly, shortleaf, and Virginia pines, oaks, gums, and ash. Vines and shrubs found on the mostly young plantations include honeysuckle, blackberry, and trumpet creeper. This forested land provides good habitat for mammals, birds, and other wildlife including white-tailed deer, rabbits, squirrels, fox, woodchuck, turkey, owls, woodpeckers, turtles, snakes, and frogs.

Grasslands are primarily leased agricultural land used for cattle grazing. This habitat consists mostly of shrubs, vines, and grasses including elderberry, sumacs, poison ivy, kudzu, fescue, broomsedge, white clover, ragweed, and poke weed. Grasslands provide food and cover for mammals, birds, and other wildlife including opossum, woodchuck, coyote, dove, falcons, hawks, starlings, and snakes.

Principal Vegetation - A variety of native vegetation communities exists on the Arsenal. Common trees and shrubs found include: various pines (*Pinus spp*.), hickories (*Carya spp*.), oaks (*Quercus spp*.), elms (*Ulmus spp*.), maples (*Acer spp*.), ashes (*Fraxinus spp*.), eastern redcedar (*Juniperus virginiana*), yellow poplar (*Liriodendron tulipifera*), sweet gum (*Liquidambar styraciflua*), sycamore (*Platanus occidentalis*), flowering dogwood (*Cornus florida*), and sumacs (Rhus spp.). Common vines include: greenbrier (*Smilax spp*.), poison ivy (*Rhus radicans*), and Virginia creeper (*Parthenocissus quinquefolia*). Common herbaceous plants include: pokeweed (Phytolacca americana), and beggarweed (*Desmodium spp*.). Common grasses include: broomsedge (*Andropogon spp*.), cane (*Arundinaria spp*.), paspalum grass (*Paspalum spp*.), fescue (*Festuca sp*.), and plume grass (*Erianthus sp*.). A more complete listing of the native vegetation within Redstone Arsenal boundaries is found in Appendix B of the Natural Resources Management Plan for Redstone Arsenal, July 1995.

Aquatic Vegetation - A variety of aquatic and marsh plants are located in suitable habitats across Redstone Arsenal. These include smartweed, cattail, duckweed, coontail, parrot's feather, water primrose, lizard's tail, and dozens of species of graminoids (grasses and grass-likes). (Weber 1996)

Non-forest Lands - Hay and pasture lands encompass approximately 4,145 acres. The remaining acreage is comprised of semi-improved grounds (7,426 acres), old-field land, and wildlife openings.

Forest Lands - According to the 1988 Redstone Arsenal forest inventory, 16,180 acres (approximately 42 percent of the Arsenal) are covered in forest: approximately 4,226 acres as pines; 5,528 acres as hardwoods; 3,181 acres as mixed pine-hardwoods; and 3,245 acres as mixed cedar-hardwoods.

The forest is temperate and composed of over 100 tree species, of which 21 are designated as potential commercial forest product species. Four major forest types are distributed over a landscape ranging from river bottomland floodplains and gently sloping uplands to steep, mountainous karst topography. The major upland forest types are natural and plantation pine, pine/hardwood, hardwood, and eastern red cedar/hardwood. The upland forest trees are largely eastern redcedar; loblolly pine; northern red, black, white, chinkapin, post and chestnut oaks; white ash; mockernut, pignut, and shagbark hickories; and black locust. Understory trees on upland sites include the redbud, flowering dogwood, possumhaw, Carolina buckthorn, hophornbeam, shining sumac, and winged elm. (Weber 1996)

The lowlands are dominated by oaks in the more isolated wetland flats, and by a mixture of trees in floodplains and along karst basins. From those species more likely to be found in shallow swamps to the upper limits of flood, the species include water tupelo, water hickory, swamp privet, willow, overcup oak, willow oak, sycamore, river birch, red maple, sweetgum, swamp chestnut oak, sugarberry, water oak, cherrybark oak, blue beech, beech, and tulip poplar. Understory trees include silky dogwood, deciduous holly, storax, clammy azalea, hawthorns, and buttonbush. Ground covers are quite varied depending on the overstory, but in ecotones where sunlight penetrates peppervine, poison ivy, false nettle, lizard's tail, virginia creeper, crossvine, trumpet creeper, supplejack, blackberry, and greenbriar are common. (Weber 1996)

Pine stands located on the installation are generally dominated by Loblolly pine with some shortleaf pine. Most of the older pine stands are very dense with minimal ground cover with the exception of several stands which are extensively covered with kudzu. Where ample sunlight reaches the forest floor, a variety of understory vegetation flourishes including box elder, blackberry, greenbriar, sassafras, smooth and winged sumacs, honey and black locust, wild grape, and a variety of seedling oaks. Herbaceous flora is an important component of these pine stands, where conditions allow, and are dominated by Japanese honeysuckle, poison ivy, broomsedge, and various grasses. Pine stands occupy 4,226 acres of Redstone Arsenal. As mentioned above, an estimated 2,000 acres of the open forested land is covered with kudzu which seriously threatens the natural vegetation and diversity of these areas.

Forest cover types are dependent on topography and soil types. In general, pure hardwood stands are found in low-lying wetland areas where soils are saturated with water much of the time. Pines are distributed over well-drained low ridges and in some of the low areas. Cedar stands and cedar mixed with hardwoods make up the predominant land cover upon limestone outcrops on mountain slopes. Major upland land cover types, with indications of ecological successional maturity (average stand age), are shown in Appendix G of the Final Environmental Assessment for Redstone Arsenal Master Plan Implementation, December 1994. The major upland cover types shown in this appendix are defined as follows:

- Hardwoods
  - Mature stands (average age 66 years and greater)
  - Intermediate age stands (average age 42 to 65 years)
  - Young stands (average age 1 to 41 years)

- Pines
  - Mature stands (average age 66 years and greater)
  - Intermediate age stands (average 32 to 65 years)
  - Young stands (average age 1 to 30 years)
- Mixed Hardwoods/Pines

    - Mature stands (average age 66 years and greater)
    - Intermediate age stands (average age 42 to 65 years)
    - Young stands (average age 1 to 41 years)
- Mixed Pines/Hardwoods
    - Mature stands (average age 66 years and greater)
    - Intermediate age stands (average age 32 to 65 years)
    - Young stands (average age 1 to 30 years)
- Cedar stands
    - Intermediate age stands (average age 37 to 67 years)
    - Young stands (average age 1 to 36 years)
- Shrublands
- Old-fields and Pastures
- Developed Operational Areas

Fish and Wildlife - Some of the most common mammals on RSA and WNWR are white-tailed deer, beaver, eastern cottontail rabbit, swamp rabbit, gray squirrel, fox squirrel, striped skunk, red bat, woodchuck, muskrat, opossum, raccoon, gray fox, and coyote (Weber, 1996). A comprehensive listing of mammals occurring on or in the vicinity of the Arsenal is presented in Appendix F of the *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation*.

Over 250 bird species are residents or migrants on RSA. As many as 100 species may be encountered year round. A comprehensive listing of birds occurring on or in the vicinity of RSA, including WNWR, is presented in Appendix F of the *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation*.

There is the potential for over 100 species of fish to occur in RSA waters. Roughly half of these are considered to be abundant or common. (U.S. Army Missile Command, 1995) A comprehensive listing of fish species collected at RSA and WNWR is presented in Appendix F of the *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation.*

Reptile and amphibian species are well represented on RSA and WNWR lands. Fifty-one species of reptiles and twenty-nine species of amphibians are known to be present in the vicinity. A comprehensive listing of these species is presented in Appendix F of the *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation*.

There is the potential for any of the terrestrial wildlife species listed in the above referenced documents to occur either temporarily or permanently in the vicinity of the buildings slated for demolition. Fish and other aquatic species would not occur on any of the areas considered as suitable habitat is lacking.

Aquatic Habitats - RSA is located on the north bank of the Tennessee River about 46 miles above Wheeler Dam and 17 miles downstream from Guntersville Dam. Over 10,000 acres of the Arsenal are affected by high stages of the Tennessee River and other tributary streams (U. S. Army Missile Command, 1994). Huntsville Spring Branch (HSB), with a drainage area of 86 square miles, originates in springs and creeks of nearby mountain slopes, and flows southward through the urban areas of the City of Huntsville. In addition, HSB receives run-off from wooded mountainsides and open pasture or strip-crops within the watershed surrounding Huntsville. The branch then enters a swampy area in the northeast corner of the Arsenal at Mile 10 and flows southwestward to join Indian Creek, a tributary of the Tennessee River. Indian Creek, which enters at the northern boundary of the Arsenal, drains an area of 143 square miles. It joins the Tennessee River at Mile 321. Indian Creek extends upstream through gently rolling topography

with relatively little built-up area containing pasture land, strip-cropping, and wooded areas. The normal pool of Wheeler Lake, at elevation 556, backs into the reservation to form permanent pools of 680 and 575 acres, at the lower end of these streams. Within the installation boundaries, Indian Creek drains approximately 12,000 acres and HSB drains approximately 11,000 acres. The southern portion of the reservation drains into the Tennessee River through smaller channels and approximately 2,000 acres, located south of Madkin Mountain, drains into outlets constructed in conjunction with Fowler Road.

No significant aquatic resources are located in the vicinity of any of the buildings considered for demolition in this document.

Threatened and Endangered Species - Biological resources warranting special protection include threatened and endangered species. Under the Endangered Species Act, Federal agencies are prohibited from jeopardizing threatened or endangered species or adversely modifying habitats essential to their survival. Alabama ranks fifth in the nation (after California, Texas, Hawaii, and Florida) in the number of Federally listed endangered and threatened plants and animals.

Table 3-1 lists floral and faunal species whose accepted ranges overlap Redstone Arsenal and are considered threatened or endangered by either State or Federal wildlife authorities. Below are brief discussions of threatened and/or endangered species listed or proposed for listing by the U.S. Fish and Wildlife Service that are known to occur on or be transient in the area of Redstone Arsenal (USFWS *et al.*, 1995) The State of Alabama classifies Federally listed threatened and/or endangered species found in the State collectively as "Alabama Protected" species (Guyse 1996).

Price's Potato-bean, *Apios priceana* (Federal Threatened) - A climbing yellow-green vine that grows from a stout, potato-like tuber. The vines may be up to 15 feet long with pale pink or greenish-yellow pea or bean type flowers which bloom from July through August. The fruit is a pod about 4 to 6 inches long. The plant grows in forest openings in mixed hardwood stands where ravine slopes grade into creek or stream bottoms.

Dwarf trillium, *Trillium pusillum var. alabamicum* (Federal Candidate) - The dwarf trillium is known to occur in broad-leafed deciduous forested wetlands on RSA. It is a small herbaceous plant, roughly 3 inches tall, with lanceolate leaves. The plant blooms in March and is gone by midsummer.

Table 3-1: Federally Listed Endangered and Threatened, Alabama Protected, and Special Concern Species Occurring on or Near Redstone Arsenal

SPECIES	STATUS
Gray Bat - *Myotis grisescens*	Federal Endangered, Alabama Protected
Indiana Bat - *Myotis sodalis*	Federal Endangered
Red-cockaded woodpecker - *Picoides borealis*	Federal Endangered, Alabama Protected
Bald eagle - *Haliaeetus leucocephalus*	Federal Threatened, Alabama Protected
Golden eagle - *Aquila chrysaetos*	Alabama Protected
Cooper's hawk - *Accipiter cooperi*	Alabama Special Concern
Alligator snapping turtle - *Macroclemys temmincki*	Federal Candidate, Alabama Special Concern
Eastern box turtle - *Terrapene carolina*	Alabama Special Concern
Eastern hellbender - *Cryptobranchus alleganiensis*	Alabama Protected
Green salamander - *Aneides aeneus*	Alabama Special Concern
Tennessee cave salamander - *Gyrinophilus palleucus*	Alabama Special Concern
American alligator - *Alligator mississippiensis*	Federal Threatened
Tuscumbia Darter - *Etheostoma tuscumbia*	Federal Candidate
Slackwater darter - *Etheostoma boschungi*	Federal Threatened, Alabama Protected
Southern cave fish - *Typhlichthys subterraneus*	Alabama Special Concern
Alabama cave shrimp - *Palaemonias alabamae*	Federal Endangered, Alabama Protected
Pink mucket pearly mussel - *Lampsilis orbiculata*	Federal Endangered
Fanshell - *Cyprogenia stegaria*	Federal Endangered, Alabama Protected
Dromedary pearly mussel - *Dromus dromas*	Federal Endangered, Alabama Protected
Morefield's Leather Flower - *Clematis morefieldii*	Federal Endangered
Price's Potato-bean - *Apios priceana*	Federal Threatened
Mohr's Barbara's Buttons - *Marshallia mohrii*	Federal Threatened, Alabama Protected
Leafy prairie clover - *Dalea foliosa*	Federal Endangered
Small whorled pogonia - *Isotria medeoloides*	Federal Endangered
American Hart's-tongue fern -	
Phyllitis scalopendrium var. *americanum*	Federal Threatened
Virginia spirea - *Spiraea virginiana*	Federal Threatened
Tennessee yellow-eyed grass - *Xyris tennesseenis*	Federal Endangered
Alabama Snow-wreath - *Neviusia alabamensis*	Federal Candidate
Dwarf Trillium - *Trillium pusillum* var. *alabamicum*	Federal Candidate
Cumberland rosinweed - *Silphium brachiatum*	Federal Candidate
American ginseng - *Panax quinquefolins*	Federal Candidate
Gray Necklace Leavenworthia - *Leavenworthia torulosa A.*	Alabama Protected
Black stemmed spleenwort - *Asplenium resiliens*	Alabama Special Concern
Elliot's fan-petal - *Sida elliottii*	Alabama Special Concern
Limestone Adder's tongue - *Ophioglossum engelmannii*	Alabama Special Concern
Pinesap - *Monotropa hypopithys*	Alabama Special Concern
Sessile Trillium - *Trillium sessile* L.	Alabama Special Concern
Gray Purple Fringeless Orchid - *Habenaria peramoena*	Alabama Special Concern
Showy Orchid - *Orchis spectabilis* L.	Alabama Special Concern
Smoke Tree - *Cotinus obovatus* Raf.	Alabama Special Concern
Persoon Twinleaf - *Jeffersonia diphylla* L.	Alabama Special Concern
Yellowwood - *Cladrastis lutea* Michx.	Alabama Special Concern
Kentucky Coffee Bean - *Gymnocladus dioica* L.	Alabama Special Concern
Basil Balm - *Monarda clinopodia* L.	Alabama Special Concern
Great Yellow Wood Sorrel - *Oxalis grandis*	Alabama Special Concern
Dolls' Eyes - *Actaea pachypoda* Ell.	Alabama Special Concern
Carolina Anemone - *Anemone caroliniana* Walt.	Alabama Special Concern
Water Speedwell - *Veronica anagallis-aquatica* L.	Alabama Special Concern
Few-flowered Valerian - *Valeriana pauciflora* Michx.	Alabama Special Concern

Source: Extracted and summarized primarily from Alabama Natural Heritage Program 1995 and Guyse 1996.

Tuscumbia darter, *Etheostoma tuscumbia* (Federal Candidate) - The Tuscumbia darter is restricted to the Tennessee River drainage in northern Alabama. Its preferred habitat is in springs and spring runs with dense aquatic vegetation. It has been extirpated from Tennessee. This species is commonly found in its preferred habitat. It has been found on the Arsenal at a single location.

Alabama cave shrimp, *Palamonias alabamae* (Federal Endangered, Alabama Protected) - Alabama cave shrimp are known only from caves in Madison County, Alabama: Shelta Cave, where it is believed to have been extirpated, Bobcat Cave on Redstone Arsenal, Glover Cave, Hering Cave, and possibly Brazelton Cave. Little data is available about this species. The small shrimp have no eyes and no pigmentation except around the thorax region. Their preferred habitat is pools in caves with a silt layer and windows in the substrate connecting the lentic pools with lower water levels.

American alligator, *Alligator mississippiensis* (Federal Threatened) - The American alligator is an adaptable species; it occurs in rivers, swamps, small and large ponds, sloughs, and freshwater and brackish marshes. They occur from coastal North Carolina southward throughout Florida and westward on the Coastal Plain to extreme southeastern Oklahoma and eastern and southeastern Texas. Their range includes all of Louisiana, southern Arkansas, and roughly the southern one-half and two-thirds of Alabama and Mississippi, respectively. Over a decade ago, a number of alligators were released on WNWR. Alligators have been sighted, and even captured, on RSA; however, these occurrences are infrequent.

Gray bat, *Myotis grisescens* (Federal Endangered, Alabama Protected) - The gray bat is more restricted to caves than any other U.S. mammal, roosting year-round in caves. In Alabama, this bat occurs principally in the Tennessee River Valley. Summer caves are nearly always located within one-half mile of rivers and reservoirs over which the bats forage for insects. The gray bat has a wingspread of about 11-12 inches and is uniformly dark gray. Although none of the caves surveyed [on RSA] appeared to support gray bats, the species does forage along waterways on RSA, and the possible existence of roosting habitat cannot be ruled out at this time. The nearest known gray bat cave is Talucah Cave, across the river and about 2 miles south of the Arsenal boundary. (ALNHP 1995)

Bald eagle, *Haliaeetus leucocephalus* (Federal Threatened, Alabama Protected) - The primary habitat requirements for bald eagles are large living trees near bodies of water. Nests are usually in conspicuous locations in tall trees either in the open or in a grove, but seldom in deep woods. The majority of their diet is composed of fish; therefore, foraging almost always occurs near estuaries, lakes, rivers, large ponds, open marshes, and shorelines. Foraging habitats also includes large trees nearby for perching. Bald eagles are known to use Tennessee River impoundments and the WNWR as foraging habitat. Of the 15 eagle nests reported in Alabama in 1995, three were from the vicinity of Guntersville Dam, about 20 miles to the southeast of the Arsenal. As the population in Alabama continues to recover, relatively undisturbed areas with tall trees on the Arsenal may eventually be used by breeding eagles. Bald eagles occur as transient migrants on the Arsenal especially during winter months and along the southern border.

Cumberland rosinweed, *Silphium brachiatum* (Federal Candidate) - The Cumberland rosinweed is a tall plant, usually 3-5 feet in height, with a smooth slender stem and somewhat triangularly shaped leaves. It typically occurs in the southeastern United States and on chalky limestone clad with tall grasses and a variety of other herbs on hillsides and slopes.

American ginseng, *Panax quinquefolium* (Federal Candidate) - The American ginseng is a perennial herb with a solitary stem bearing whorled, palmately compound leaves. It has small,

white to greenish white flowers which occur in May and yield red, seeded fruits in the fall. It typically occurs in rich wooded areas in the mountains and hill country of Alabama and other eastern states.

Southern rosinweed, *Silphium confertifolium* (Category 2) - Southern rosinweed is a course herbaceous perennial in the aster family. Single stems up to 2 feet tall support leaves that are broadly lance-shaped mostly near the stem base. Lemon-colored flowers appear in mid-summer. This rosinweed occurs in prairies and glades over chalk (limestone) in heavy black clay earth. It is known from Alabama and Mississippi. It is found in the undeveloped mountainlands of Redstone.

Harper's umbrella plant, ***Eriogonum longifolium var. harperi* (Category 2)** - Harper's umbrella plant is a member of the Buckwheat family that grows up to 6.5 feet tall from a basal rosette of long, oblong-shaped leaves. The pale yellow-green flowers are on a loosely branched panicle. Harper's umbrella plant is confined to thin soil of limestone over bluffs.

Skirted hornsnail, *Pleurocera pyrenellum* (Category 2) - Skirted hornsnail is poorly known and insufficient information is available to characterize the habitat of this species.

Wetlands - For an area to be classified as a Clean Water Act (CWA) (Section 404 [b]) jurisdictional wetland, evidence of three parameters are required (U. S. Army Corps of Engineers, 1987). These parameters are the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. Hydrophytic vegetation can be described as plant life growing in water or in a substrate that is, at least periodically, deficient in oxygen as a result of excessive water content. Hydric soils are soils that have been saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in their uppermost layer. Wetland hydrology requires that the potential wetland area be inundated or have a water table within inches of the ground surface for a specified period.

Wetlands on RSA are home to a large number and variety of plant and animal species. About 26 percent of the installation is covered by wetlands. The wetlands are mostly associated with creeks or spring runs that are easily effected by the elevation of the Tennessee River (Weber, 1996) and have bottomland hardwood forests associated with the Tennessee River and its major tributaries. The water levels in the Tennessee River and its tributary system fluctuate seasonally according to the flood control mission of Wheeler Dam. Beaver activity also influences low lying areas with periodic and sometimes permanent inundation.

Detailed jurisdictional wetland maps for the installation were not available for this analysis. National Wetlands Inventory (NWI) maps for wetland types in Madison County, prepared by the USFWS were used instead. These non-jurisdictional maps were constructed from photo interpretations of aerial photography and were verified by spot ground-truthing. Recent work reports the total wetland acreage of the Arsenal to be 9,889.5 acres (Geonex, 1995). Table 3-2 provides a summary of the wetlands and acreage by major wetland type within the installation boundary.

About half of the Arsenal wetlands are under WNWR jurisdiction. RSA's obligation is to oversee construction projects near any wetlands and to provide protection for both WNWR and installation wetlands and mitigate any problems caused by construction in or near these areas.
Wetland areas support a variety of plant life including tupelo, water oak, willow oak, black gum, eastern cottonwood, red maple, black willow, dogwood, pepperbush, lily pads, and aquatic grasses. Wetland areas house an abundant array of mammals, reptiles, amphibians, fishes, and invertebrates including beaver, muskrat, cottonmouth moccasin, water snakes, frogs, salamanders,

turtles, bluegill, bass, crappie, catfish, and carp. WNWR attracts many species of waterfowl, such as ducks and geese, and provides wintering habitat for migrating flocks.

Table 3-2 Wetland Types on Redstone Arsenal

Wetland Type	Acreage (rounded to nearest 1/10 acre)
Palustrine emergent (PEM)	1,213.7
Palustrine forested (PFO)	6,381.7
Palustrine aquatic beds (PAB)	2.4
Palustrine scrub-shrub (PSS)	1,057.6
Palustrine unconsolidated bottoms (PUB)	62.8
Palustrine unconsolidated shoreline (PUS)	7.0
Palustrine overlapping types (Pmulti)	400.3
Lacustrine types (all)	668.5
Riverine/Stream types (all)	95.5
Total	9,889.5 acres

Source: Data from Geonex, 1995

Unique Habitats - Biological resources warranting special protection include species that occupy unique habitats. There are several locations throughout RSA that fall under these categories (ALNHP, 1995) including several aquatic and terrestrial cave communities, springs, and bluffs. There are no unique habitats known to be near any of the buildings under consideration for demolition.

3.3 CULTURAL RESOURCES

Region of Influence - The ROI is the area currently occupied by the buildings under consideration for demolition.

Affected Environment - Cultural resources consist of prehistoric and historic districts, sites, structures, artifacts, and any other physical evidence of human activity considered important to a culture or community for scientific, traditional, religious, or other reasons. Cultural resources are divided into three categories: archaeological (prehistoric and historic), historic resources and structures, and traditional (e.g., American Indians or other ethnic groups).

Prehistoric archaeological resources are defined as physical remnants of human activity that predate the advent of written records in a particular culture and geographic region. They include archaeological sites, structures, artifacts, and other evidence of prehistoric behavior.

Historic resources consist of physical properties or locations postdating the advent of written records in a particular culture and geographic region. They include archaeological sites, structures, artifacts, documents, and other evidence of human behavior. Historic resources also include locations associated with events that have made a significant contribution to history or that are associated with the lives of historically significant persons.

Traditional native resources may be prehistoric sites and artifacts, historic areas of occupation and events, historic and contemporary sacred areas, materials used to produce implements and sacred

objects, hunting and gathering areas, and other botanical, biological, and geological resources of importance to contemporary Native American groups.

The Arsenal is divided into three topographic or landform zones that possess varying degrees of archaeological potential. Zone 1 is composed of rolling land combined with flat plateaus that have undergone considerable erosion and is considered to have low to moderate archaeological potential. Zone 2 is made up of the flood plains on the Arsenal and is considered to have high archaeological potential. Zone 3 is composed of mountainous land and is considered to have low archaeological potential. (U.S. Army Missile Command, 1994)

Cultural and archaeological resources are limited, nonrenewable resources whose potential for scientific research or value as a traditional resource may be easily diminished by actions that significantly impact the integrity of the property. Activities that disturb the ground in which an archaeological site is present can destroy temporally and culturally diagnostic artifacts and features or alter artifact provenance. The intensity and context of the alteration of the distinctive characteristics and integrity of a property determine significance of impacts.

The prehistory of RSA spans the time range from circa 12,000 B. C. until European contact (approximately 1800), and there are now 349 known archaeological sites recorded on RSA. RSA has yielded a number of particularly significant Paleo-Indian period sites (from 8,000 to 12,0000 B. C.). The Redstone Point, an identified Clovis point linked to the Paleo-Indians, is named for an example found on RSA. Native American occupation of the Arsenal area is believed to have been nearly continuous through the late Mississippian Period (A. D. 899-1500), at which time Native American populations declined in the area. Although the historic Chickasaw established a village on Hobbs Island (in nearby Huntsville) by at least the late 1760s, inter-tribal rivalries between the Chickasaws and Cherokees essentially turned the RSA area into a "no man's land." The 1786 Treaty of Hopewell placed the boundary line between the Chickasaws and Cherokee directly through the middle of Madison County. This area was opened up for American settlement in the early 1800s, and the City of Huntsville was incorporated in 1811. Both the Chickasaw and Cherokee tribes were completely removed from northeastern Alabama by 1832.

From the establishment of Madison County in the early 1800s until the beginning of World War II in 1941, the RSA area was occupied by a number of small subsistence farms. A number of small agrarian, rural communities were located in this portion of Madison County. The rich soils of the area, the railroad transportation routes of the Memphis and Charleston Railroad (running east-west) and the Nashville and Decatur Railroad (running north), and the river transportation offered by the Tennessee River combined to make Madison County a productive and wealthy agricultural area. The Memphis and Charleston Railroad continues to operate on the antebellum route, today owned and operated by the Norfolk Southern Railroad.

During the mid-Nineteenth Century, the "Southern Rights" movement arose in the states of the Deep South, advocating secession of the southern states from the Union. With the election of Republican Abraham Lincoln as President in 1860, secession became a reality. North Alabama was not a stronghold for secession, and all nine counties sent Cooperationist rather than Secessionist delegates to the Alabama Secession Convention (Dorman, 1995). Because of the strategic importance of the Memphis and Charleston Railroad, Union forces occupied the area as early as April 1862. By the spring of 1864, North Alabama was a Federal transportation and supply depot supporting Major General William T. Sherman's Atlanta Campaign. To protect this important rail line, garrisons were established on the Tennessee River at crossing sites and on the Memphis and Charleston Railroad. River garrisons were established at Whitesburg (Ditto Landing), Triana, and Mooresville near RSA. Railroad garrisons were established at Huntsville, Madison Station and at Indian Creek on the Memphis and Charleston in the vicinity of RSA.

Federal and Confederate units occasionally traversed the RSA area, and camped on lands now belonging to the arsenal.

Following President Lincoln's Emancipation Proclamation, which went into effect on January 1, 1863, the southern slave-based economy was eradicated. With the end of the war, the North Alabama economy was in turmoil. By the 1870s a tenant farming system had replaced the plantation agricultural system. A 1908 recruitment booklet for Huntsville stated of the city's cotton mills:

"We have nine cotton mills, with an aggregate capital of over four and one-half million dollars, employing four thousand operatives, which calls for a pay roll of about eighty thousand dollars monthly and consume sixty thousand bales of cotton per year. They spend in the course of twelve months a little short of a million dollars for labor and nearly $3,000,000 for cotton. The products of these mills are shipped to all parts of the world, and one of the mills makes direct shipments to China and Japan. The employees are well housed, are furnished with free parks, in which they enjoy band music two nights in the week during the summer months, and some of the mills maintain free schools. There is plenty of room for more cotton mills, and for other factories which would align themselves with them." (Business Men's League of Huntsville, Alabama, 1908)

With the outbreak of World War II in 1939, American military and political leadership determined to take efforts to begin preparing the United States for effective national defense. These efforts, collectively known as the Protective Mobilization, were broad based efforts to modernize the small American armed forces and military industry, and prepare for involvement in the European and Asian conflict. One area of military manufacturing assessed was chemical weapons. The United States had only a single chemical manufacturing installation, Edgewood Arsenal, Maryland. Edgewood would undergo expansion in 1941, but would still not be large enough to support the nation's anticipated chemical manufacturing needs. Accordingly, three Chemical Warfare Service (CWS) facilities were planned at Huntsville in Alabama, Pine Bluff in Arkansas, and Rocky Mountain in Colorado. All of these were to be responsible for the production of a wide range of toxic chemicals, incendiaries, smoke munitions, and protective clothing. (U.S. Army Missile Command, 1997b, hereinafter cited as Panamerican Consulting, *WW II Architectural Assessment of Redstone Arsenal*)

In 1941, the U. S. government condemned 37,000 acres of land southwest of Huntsville, and construction began on the Huntsville CWS facility on August 4, 1941. Construction was performed by a Baltimore based engineering firm, Whitman, Requartdt and Smith (WRS). By 1942 there would be three actual facilities at Huntsville. Huntsville Arsenal provided the logistical, administrative, housing, and maintenance services for the base, in addition to manufacturing areas. Redstone Ordnance Plant, operated by the Ordnance Department, fabricated munitions. The Gulf Chemical Warfare Depot (GCWD), operated by the CWS, was responsible for the manufacture of a number of chemicals, including mustard gas (H, a toxic agent), Lewisite (L, a toxic agent), Chlorine (a toxic agent), white phosphorous (WP, an obscuration and marking agent), phosgene (CG, a toxic agent), tear gas/Adamsite (CN-DM, an incapacitating agent), and Thionyl Chloride (TC, a toxic agent). By the end of the war, Huntsville had become the sole manufacturer of colored smoke munitions, was noted for its production of gel-type incendiaries (such as napalm and jellied gasoline), and had produced more than 27 million items of chemical munitions with a total value of more than $134.5 million. (U.S. Army Missile Command, 1997b)

Huntsville Arsenal consisted of three manufacturing plants, an administrative area, and Redstone Army Airfield. Plants 1 and 2, duplicates of each other, manufactured a wide range of chemicals.

Plant 3 produced incendiary materials. Plants 1 and 2 were sufficiently dispersed that a single air raid would not be able to cripple both plants simultaneously. Chemicals manufactured at Huntsville Arsenal were transported to Redstone Ordnance Plant. Here ordnance items were actually manufactured. Redstone Ordnance Plant had two burster loading assembly lines and three chemical munitions assembly lines. Bursters refer to the explosive elements that detonate and disperse the chemical weapon. A fourth chemical munitions assembly line was completed at the end of World War II and never used. Redstone Ordnance Plant's six lines are divided into "North Plant" and South Plant" areas. "North Plant" consists of lines 1, 2 and 5 and "South Plant" consists of lines 3 and 4. Had line 6 gone into operation, it would have been located in the "South Plant" area. Redstone Ordnance Plant also had a significant administrative area. GCWD was responsible for the handling of chemical ammunition and toxics for zone distribution, shipment to ports of embarkation, and reserve storage. GCWD was located in the extreme southwestern end of Huntsville Arsenal. The depot primarily consisted of warehouse, igloo (bunker), toxic yard and open storage areas. Most GCWD administrative and support activities were provided by Huntsville Arsenal. (U.S. Army Missile Command, 1997b)

Following World War II, RSA was temporarily inactivated. In fact, several manufacturing lines were never placed into production. Portions of the base were closed, and a number of buildings were sold. Several private industries leased or purchased a number of the World War II facilities.

This brief period of inactivity came to an end in 1950, when RSA's large area, excellent transportation infrastructure, and proven chemical production facilities resulted in the Arsenal's re-activation as the Nation's rocket and missile research center. In 1951, RSA was assigned the national responsibility for rocket and missile research, development, and testing. At the heart of these activities was a group of 120 German scientists, led by Dr. Werner Von Braun, that had developed and launched the V-2 rocket during World War II. Although this effort was initially oriented to the research and development of military ballistic rockets and missiles, the Russian launch of Sputnik, combined with the failure of American developed hardware, resulted in Von Braun's team being asked to launch an American satellite. Within three months, Von Braun and his scientists successfully launched the Explorer I satellite.

The Cold War (1946-1989) is a term which describes the tense, strained relations which existed between the United States and the Union of Soviet Socialist Republics (USSR). This period occurred between the end of World War II and the collapse of the USSR. This period saw a rebirth of what is now RSA and included the consolidation of Redstone Arsenal, Huntsville Arsenal and the GCWD. The union of installations brought a change in mission, as the Army consolidated its missile/rocket research and manufacturing assets. Because of RSA's successful involvement in numerous rocket and missile programs during the Cold War era, related U. S. Army commands were subsequently established at the Arsenal. These include the U. S. Army Missile Command (recently combined with the U.S. Army Aviation and Troop Command to form the U.S. Army Aviation and Missile Command [AMCOM]), Ordnance and Missile Munitions Center and School (OMMCS) and Redstone Technical Test Center (RTTC). Late in 1959, Von Braun and most members of his team were transferred from the U. S. Army to a new government organization responsible for space exploration, the National Aeronautical and Space Administration (NASA). NASA established Marshall Space Flight Center (MSFC) on RSA. NASA, AMCOM, OMMCS and RTTC continue their missions at RSA today. Although a tenant organization of RSA, NASA is responsible for National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) compliance for the structures and facilities on MSFC.

As a result of RSA's intense involvement in the space industry, National Register of Historic Places (NRHP) recognition has been granted to a number of facilities at MSFC and administrated by NASA (Washington, D. C.: National Trust of Historic Places, 1994):

- Neutral Buoyancy Space Simulator, MSFC (National Historic Landmark)
- Propulsion and Structural Test Facility, MSFC (National Historic Landmark)
- Redstone Test Stand, MSFC (National Historic Landmark)
- Saturn V Dynamic Test Stand, MSFC (National Historic Landmark).

3.4 HAZARDOUS MATERIALS AND WASTE

Region of Influence - The ROI are the buildings under consideration for demolition and the immediately surrounding land.

The buildings, proposed for demolition, have been utilized for a variety of purposes over the years.

Hazardous Materials - Regulatory agencies have defined hazardous material as applied to specific situations. The broadest and most applicable definition is specified by the Department of Transportation (DOT) for regulation of transportation of hazardous materials on public roads. DOT defines a hazardous material as a substance or material which is capable of posing an unreasonable risk to health, safety, or property when transported in commerce and has been so designated (49 CFR 171.8). There are no public roads on RSA, and no off-site transportation of hazardous materials is anticipated from the Proposed Action.

Several Federal agencies oversee hazardous material usage. DOT regulates packaging and transporting of hazardous materials in 49 CFR parts 171 through 180 and Part 397. OSHA regulates the use of hazardous materials in the workplace in 29 CFR, primarily Part 1910. EPA regulates environmental safety and public health issues associated with hazardous materials through specific criteria applied to areas such as air emissions and water discharge.

Lead-Based Paint **-** Lead was used in many paints applied before the early 1980's. It was also used in piping, cable sheaths, batteries and solder. Lead is regulated in the workplace for exposure to workers although most documented health effects relate to pregnant women and children where exposure has been correlated with birth defects and learning difficulties. As a result of these risks, there has been a large scale lead abatement program within public buildings over the last few years in the U.S.. The requirements for workers to follow dust control techniques and respiratory protection normally only become effective when paint containing lead is abraded or the structure is demolished. (The Environmental News, 1995) There are several buildings that are suspected to contain lead-based paint since they were constructed in the 40's and 50's. It is commonly accepted that structures that were built prior to 1978 are suspected to contain lead-based paint, however, through the years most lead-based paint that has not been abated has been painted over with oil and/or latex-based paints.

Asbestos-Containing Materials **-** Historically, asbestos has been used in literally hundreds of products. Collectively, these products are frequently referred to as asbestos-containing materials (ACM). Asbestos gained widespread use because it was plentiful, readily available, low in cost, and had unique properties. It does not burn, is strong, conducts heat and electricity poorly, and is impervious to chemical corrosion. Asbestos surveys have been conducted throughout the Arsenal on various occasions. Of the 35 buildings located throughout the Arsenal, 25 are known to contain asbestos, see Table 3-3 for a complete listing. Also, transite roofing and siding are located on covered walkways in the RARE facility.

Hazardous Waste - Waste materials (less commonly referred to as solid waste) are defined in 40 CFR 261.2 as, "any discarded material (i.e., abandoned, recycled, or 'inherently waste-like')" that is not specifically excluded. This can include both solid and containerized liquid materials. Hazardous waste is further defined in 40 CFR 261.3 as any solid waste not specifically excluded that meets specific concentrations or has certain toxicity, ignitability, corrosivity, or reactivity characteristics. Hazardous waste oversight is provided primarily by the EPA (as mandated by Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and Superfund Amendments and Reauthorization Act (SARA)). EPA regulations are found in 40 CFR. DOT regulates hazardous waste transportation. DOT requirements are found in 49 CFR.

3.5 HEALTH AND SAFETY

Region of Influence - The Regions of Influence are the buildings under consideration for demolition and the immediately surrounding land.

Affected Environment - Health and safety includes consideration of any activities, occurrences, or operations that have the potential to affect one or more of the following.

- The well being, safety, or health of workers - Workers are considered persons directly involved with the operation or who are physically present at the operational site.

- The well being, safety, or health of members of the public - Members of the public are considered persons not physically present at the location of the operation, including workers at nearby locations who are not involved in the operation and the off-installation population.

The Occupational Safety and Health Administration (OSHA) is responsible for protecting worker health and safety in non-military workplaces. OSHA regulations are found in 29 CFR 1910. Protection of public health and safety is an EPA responsibility and mandated through a variety of laws such as RCRA, CERCLA/SARA, CWA and the CAA. EPA regulations are found in 40 CFR 265.382. Additional safety responsibilities are placed on the DOT in 49 CFR. Department of the Army program requirements are outlined in AR 385-100.

Note: More information to complete this table is necessary

3.6 INFRASTRUCTURE AND TRANSPORTATION

Region of Influence - The ROI for infrastructure and transportation is RSA.

Affected Environment - Infrastructure addresses those facilities and systems that provide power, water, wastewater treatment, the collection and disposal of solid waste, fire, health, and police services to RSA.

Transportation addresses the modes of transportation (air, road, rail, and marine) that provide circulation within and access to the installation. The transportation baseline sections that follow the infrastructure sections describe the existing conditions and, where appropriate, the capacities of the various transportation modes in and around RSA.

Power - Electrical service is provided by the Tennessee Valley Authority (TVA) through a number of local distribution companies. Substantial excess capacity is available within the Tennessee Valley to provide electrical service to meet all current and foreseeable requirements. The City of Huntsville provides electricity and water through Huntsville Utilities. Natural gas is provided by North Alabama Gas, through Huntsville Utilities, and is the primary fuel for boilers and heating plants. The primary source of steam for the Arsenal is the Waste-to-Energy plant owned and operated by the Huntsville Solid Waste Disposal Authority.

Water - RSA derives the majority of its water supply from the Tennessee River. Potable water is supplied from two treatment plants on the Arsenal. The primary industrial water source is Water Treatment Plant #1. In case of an emergency, RSA can obtain 1.0 million gallons per day of potable water from the City of Huntsville. Nonpotable wells are located in two areas of the Arsenal: the Visitors Control Building (Building 5105) and Test Area 3. The potable water distribution network consists of two separate systems: An upper level system which supplies water to the areas of higher elevations on the northern portions of the Arsenal and a lower level system which supplies water to the remainder of the Arsenal. Potable water is stored using 5 elevated steel tanks, 5 steel standpipes, and one concrete standpipe. This equipment is capable of storing a combined total of 2.585 million gallons. Arsenal storm-water drainage is conveyed to the Tennessee River via McDonald Creek, HSB, and Indian Creek. The southern portion of the Arsenal drains directly into the Tennessee River. (U.S. Army Missile Command, 1994)

Solid Waste - RSA operates a 73-acre solid waste disposal landfill, permitted by the State of Alabama, for the disposal of inert material consisting of rocks, concrete construction materials, asphalt, and construction debris including tree stumps and asbestos. The landfill has a one mile unpaved perimeter road. The landfill stopped accepting municipal waste (garbage) in 1992, when the Huntsville Solid Waste Disposal Authority's incinerator started operating. The equipment used to manage the landfill includes one dust control water truck, two bulldozers, a compactor, and a front-end loader. Trash and garbage generated on the Arsenal is hauled off-post for disposal. The majority of the waste is taken to the Huntsville Solid Waste Authority Waste-to-Energy Plant adjacent to RSA.

Roads - RSA has a well-developed roadway network for easy ingress and egress in three directions (the Tennessee River forms the southern border of the Arsenal preventing roadway access in that direction). The primary links in the network carry traffic to and from the Arsenal and serve as arterials for traffic movement through the area. Major north-south roads are Rideout, Patton, and Toftoy. Major east-west roads are Goss, Martin, and Redstone. All of the major roads have paved, all-weather surfaces and are in good condition.

Rail - Use of rail facilities was largely discontinued on RSA in 1973. Most of the tracks have been removed, and only two small sections of rail remain on the Arsenal. One portion of track,

less than a mile in length, is located near Patton and Redstone Roads. The second section of rail is the Southern Railway Classification Yard located in the northwestern portion of the Arsenal, west of Rideout Road**.**

Air - The RSA Airfield, controlled by AMCOM, provides research and development aircraft support and administrative aviation support to AMCOM, RSA, various tenant activities, Space and Strategic Defense Command, and Readiness Group Redstone. Redstone Army Airfield has a north-south, 7,310-foot-long and 150-foot-wide hard surface runway with concrete approaches. The runway can accommodate any aircraft in the U.S. Army's inventory used for transportation and personnel. Both military and civilian aircraft uses the airfield, although civilian aircraft require special advanced permission to use the field.

3.7 LAND USE

Region of Influence - The ROI is RSA and the immediate surrounding area.

Affected Environment - RSA prepared a Land Use Plan as part of the 1989-1994 Installation Master Plan. The Land Use Plan promotes cost effective and efficient use of available land, assists in planning for future growth and development, and promotes compatible and coordinated land use. The land on the Arsenal is divided into seven major use areas: Ammunition Supply; Test and Operations; Research and Development; Training; Troop Housing; Community Recreation; and Family Housing. Within these areas are facilities for recreation, administration, training, operational maintenance, production tests, storage, and post maintenance. The NASA Marshall Space Flight Center is also located within the Arsenal's boundaries. Approximately 30 percent (11,400 acres) of RSA is considered buildable. There are approximately 2,800 acres remaining that are considered available for development (U.S. Army Missile Command, 1994).

The 1988 RSA forest inventory shows approximately 42 percent (16,180 acres) of the Arsenal covered in forest. Approximately one-third of the Arsenal lies within the 100-year flood plain of the Tennessee River (U.S. Army Missile Command, 1994).

The buildings under consideration for demolition are dispersed throughout the Arsenal and are no longer used.

3.8 NOISE

Region of Influence - The ROI is the area occupied by the buildings under consideration for demolition and the immediately surrounding land.

Affected Environment - Noise is usually defined as sound that is undesirable because it interferes with speech and hearing, can damage hearing, or is otherwise annoying. Sound pressure magnitude is measured in decibels (dB). The basic instrument for sound measurement is a sound-level meter for measuring dBA where "A" denotes that the meter is fitted with a frequency-weighting circuit that roughly matches the sensitivity of the human ear. RSA has an Installation Compatible Use Zone (ICUZ) Program to identify noise-generating areas on the Arsenal and to minimize encroachment of noise sensitive activities both on and off the Arsenal. It is not intended to inhibit operations but to inform community officials of the expected noise generation from mission-related activities. RSA is divided into three ICUZ noise zones. Residential housing, schools, churches, and other noise sensitive land uses are located in Zone I. These land uses are considered to be marginally acceptable in Zone II, and unacceptable in Zone III. Buildings T-4809 and T-4810 located adjacent to the Redstone Army Airfield are located in

Zone III. The remainder of the buildings proposed for demolition are located in Zone I. Army facility planners work with the community governments and planning agencies to promote adequate buffer zones between the Installation's noise sources and the noise-sensitive areas. (U.S. Army Missile Command, 1994)

The principal sources of noise on the Arsenal are rocket motor flight test and static firings, warhead detonations/impacts, gun firings, demolition, and airfield operations. Noise producing activities are located such that a significant buffer zone exists between noise producing activities and the nearest population centers. The largest population densities adjacent to the Arsenal are in Huntsville on the north and east boundaries. (U.S. Army Missile Command, 1994)

3.9 GEOLOGY AND SOILS

Region of Influence - The ROI for geology and soils are the areas currently occupied by the buildings proposed for demolition.

Affected Environment - According to the U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS) Soil Survey of Madison County, a total of 94 soil phases representing 39 different soil series are mapped within the RSA boundaries. The predominant soil type mapped for the Arsenal consists of a deep, well-drained to moderately well-drained, silt loam to silty clay loam. These soils typically posses a loamy surface horizon underlain by a loamy to clayey subsoil layer with lenses of silty and/or sandy clay. Rock fragments generally occur throughout the clayey material. The colors range from a brownish-red in the northern portion to a brownish-gray in the southern portion of the Arsenal. Soil depths range from very shallow on the mountainous slopes to much deeper along the larger tributaries along the Tennessee River where broad areas have formed. Soils from six associations can be found within the Arsenals boundaries (Table 3-4).

The geologic formations in Madison County are sedimentary in origin and were formed either by the accumulation of fragments of previously existing rocks, by the accumulation of organic matter, or by chemical precipitation. Tuscumbia Limestone underlies most of RSA. This limestone has an average thickness of 150 feet; consists of gray, medium to coarse-grained, fossiliferous limestone; and contains chert nodules. It often contains enlarged openings that have developed along joints, fractures, and faults. Caves are located on RSA in the vicinity of the Weeden and Madkin Mountains. Fort Payne Chert, Chattanooga Shale, and other older geological units successively underlie the Tuscumbia Limestone. Overlying the Tuscumbia limestone, from oldest to youngest, are the Ste. Genevieve Limestone, Hartselle Sandstone, and Bangor Limestone, all of the Upper Mississippian age. The Ste. Genevieve Limestone forms the slopes of the mountains and higher elevations above the Tuscumbia formation within the southern part of the Arsenal. The Hartselle sandstone forms the top of Bradford Mountain and forms the concentric bands around Madkin and Weeden Mountains. Tan, fine-grained, fossiliferous sandstone with some siltstone and shale make up the Hartselle formation. Bangor limestone caps the Madkin and Weeded Mountains, which is comprised of gray, crystalline, oolictic, fossiliferous limestone. The surface geology of Madison County consists of unconsolidated, sedimentary material overlying the rock formations. The unconsolidated material, called "regolith", is mainly derived from the weathering of bedrock. Regolith thickness varies from 20 to 40 feet in the northeastern part of the Arsenal to as much as 80 feet in the southern and western parts. (U.S. Army Missile Command, 1994)

No significant mineral resources are known to exist on the Arsenal. (U.S. Army Missile Command, 1994)

TABLE 3-4
SOIL ASSOCIATIONS FOUND ON REDSTONE ARSENAL

Soil Association	Description
Decatur-Cumberland-Abernathy	Generally well-drained, red, fertile soils that are thick over limestone bedrock. Found on nearly level to gently rolling terrain.
Allen-Jefferson	Well-drained, generally found on undulating to rolling terrain. Usually occupy gentle valley slopes at the base of steep, stony mountains.
Holston-Tupelo-Robertsville	Poorly to moderately well-drained and variable in texture and permeability. Found on nearly level to undulating terrain.
Hermitage-Talbott-Colbert	Thin with a clayey texture and low permeability. These soils occupy the slopes adjacent to steep mountainous areas.
Huntington-Lindside-Hamblen	Located on nearly level, broad areas of bottom land along the larger creeks and rivers. Subject to periodic flooding.
Rough Stony Land	Thin soil that occupies steep mountainous slopes. Slopes are generally covered with rock debris

Source: U.S. Army Missile Command, 1994

3.10 SOCIOECONOMICS

Region of Influence - The ROI for socioeconomics is RSA, Huntsville, Madison County and northern Alabama. Socioeconomics within this EA is concerned with population and employment for this area**.**

Affected Environment - RSA contributes significantly to the economics and demographics of Madison County and northern Alabama. Madison County population, according to 1990 census data, is approximately 240,000. This figure includes over 160,000 that reside in Huntsville. The county labor force is over 140,000. RSA contributes over 21,000 Federal government and contractor jobs to the Madison County area, and is the single largest employer in the county. The Arsenal impacts the regional economy not only by direct employment of civilian and military personnel, but by procurement of goods and services as well. The salary and procurement dollars from RSA spent locally on goods and services creates a demand for additional employment and goods and services in the local and northern Alabama economies**.**

3.11 WATER RESOURCES

Region of Influence - The ROI for water resources is RSA.

Affected Environment - To protect both surface water and groundwater resources, and human health, Congress enacted the Clean Water Act and the Safe Drinking Water Act. The EPA has also established water quality standards to protect water resources. Army Regulation 200-1, Chapter 3, implements the Army Water Management Program.

The Tennessee River, flowing west, forms the southern boundary of the Arsenal. Major watercourses that flow through the Arsenal are Indian Creek, HSB, and McDonald Creek. Each of these tributaries flows generally south and empties into the Tennessee River. Most of the

western half of RSA drains into Indian Creek, and the eastern half drains into HSB. Indian Creek originates in the northwestern portion of Madison County; flows southward across RSA; and forms an arm of Wheeler Lake. Indian Creek drains approximately 63 square miles of terrain. Approximately one-third of the Arsenal lies within the 100-year floodplain of the Tennessee River. These areas on the Arsenal include most of the WNWR, several creeks and ponds, and the Tennessee River banks.

The quality of surface water varies across the drainage divide of RSA. In the western half of the drainage area including Indian Creek, the western portion of Wheeler Reservoir, and the Tennessee river, the surface water is characterized as "moderately hard" to "hard", moderately high in dissolved solids, locally high in manganese, and suitable for most uses after chlorination and treatment outlined in the state water laws. In HSB, McDonald Creek, and the eastern half of Wheeler Reservoir which lies east of the drainage divide, water quality is characterized as "hard" to "very hard", locally acidic, low in dissolved oxygen, locally high in manganese, and high in biochemical oxygen demand. The Arsenal regularly samples and tests water quality at several locations on Indian Creek and HSB.

The Fort Payne Chert and Tuscumbia Limestone are the principal aquifers in the ROI. Groundwater movement is generally from north to south. The groundwater in local aquifers moves to lowland areas in stream basins where it discharges through available openings and provides base flow to the local streams. The aquifers beneath RSA are some of the most productive in Madison County. (U.S. Army Missile Command, 1994)

The Arsenal has a facility wide National Pollutant Discharge Elimination System (NPDES) Permit.

4.0 ENVIRONMENTAL CONSEQUENCES

Federal environmental laws and regulations were reviewed to determine established thresholds for assessing environmental impacts (if any) under NEPA. Proposed activities were evaluated for their potential to result in significant environmental consequences based on the interpretation of significance outlined in the CEQ regulations for implementing the procedural provisions of NEPA (40 CFR 1500-1508) and AR 200-2, *Environmental Effects of Army Actions.*

CEQ Guidelines (40 CFR 1508.27) specify that significance should be determined in relationship to both context and intensity (severity). Three levels of impact can be identified:

- No Impact - No impact is predicted.
- No Significant Impact - An impact is predicted, but the impact does not meet the intensity/context significance criteria for the specific resource.
- Significant Impact - An impact is predicted that meets the intensity/context significance criteria for the specific resource.

Sections 4.1 through 4.11 describe expected impacts to the environment from the Proposed Action, impacts to the environment from alternatives including the No-Action Alternative, and potential mitigation measures. The amount of detail presented in each section is proportional to the potential for impacts.

4.1 AIR QUALITY

Regulatory Applicability

The proposed demolition of buildings at RSA would not generate emissions of criteria pollutants and hazardous air pollutants (HAPs). Some of the buildings contain ACM and/or lead-based paint. ACM would be removed from the buildings prior to demolition.

The NESHAP for asbestos is published in 40 CFR 61 Subpart M. It is applicable to the removal of Regulated ACM (RACM). Per Subpart M, RACM is defined as (a) friable asbestos material, (b) Category I nonfriable asbestos-containing material (ACM) that has become friable, (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations. The type of RACM material present at any structure can be determined by the test method specified in 40 CFR Part 763, Subpart E, Appendix E, Section 1, *Polarized Light Microscopy*.

The standards for demolition and renovation of buildings containing asbestos are located in Section 61.145 of Subpart M. To determine specific requirements of the standard which apply to a facility and prior to the commencement of demolition, the demolition area must be inspected for the presence of asbestos, including Category I and Category II nonfriable ACM. For demolition operations, the standards are applicable if the combined amount of RACM to be removed is: 1) at least 80 m (260 ft) on pipes or at least 15m^2 (160 ft^2) on other facility components, or 2) at least 1 m^3 (35 ft^3) off facility components where the length or area could not be measured previously.

If RACM is not being removed from a demolition operation, the procedures are not applicable, but notification of demolition is always required in accordance with Section 61.145(b). The asbestos NESHAP states in Section 61.145[c](1) that RACM need not be removed before demolition if: 1) it is Category I nonfriable ACM that is not in poor condition and is not friable,

2) it is on a facility component that is encased in concrete or other hard material and is adequately wet whenever exposed during demolition, 3) it was not accessible for testing before demolition and was discovered after demolition began, or 4) it is Category II nonfriable ACM that will not become crumbled or reduced to powder during demolition. Since the buildings will be demolished by being razed, the asbestos must be removed in accordance with the work practices of Section 61.145[c].

4.1.1 Proposed Action. The buildings discussed for proposed demolition in this EA, are located throughout RSA and the covered walkways are on the RARE Facility. Buildings and walkways which possibly contain ACM would have the ACM removed and properly disposed prior to being razed by conventional demolition methods.

4.1.2 No-Action Alternative. If the No-Action Alternative is chosen, air quality would not be impacted, since no status changes in the buildings would occur. However, these buildings may advance to a state of disrepair that may cause the asbestos to become airborne, therefore posing a potential health and safety threat to the surrounding public.

4.1.3 Selective Demolition. If this alternative were chosen, there would be no significant impacts to air quality due to the selective demolition of the RSA buildings. While periodic demolition of the buildings would produce small amounts of fugitive dust (particulate matter) and construction equipment combustion emissions, activities would be performed on a scheduled basis to not exceed Federal and state NAAQS concentrations.

4.1.4 Mitigation Measures. Demolition activities will be performed on a scheduled basis as to not exceed Federal and state NAAQS concentrations. Heavy equipment vehicles would be equipped with standard pollution control devices to minimize air quality impacts.

4.2 BIOLOGICAL RESOURCES

Criteria for determining the significance of potential impacts to biological resources are based on the relative importance of the resource, the quantity of the resource that would be impacted, the sensitivity of the resource to the proposed activities, and the duration of the impact. Impacts are considered significant if they are determined to have the potential to result in reduction of the population size of Federally listed or state-listed threatened or endangered species, degradation of biologically important unique habitats, or substantial long-term loss of vegetation and the capacity of a habitat to support wildlife (i.e. negatively impact biodiversity).

Biological diversity (biodiversity), or the variety of life and its processes, is a basic property of nature that provides enormous ecological, economic, and aesthetic benefits. The loss of biodiversity is recognized as a major national, as well as global, concern with potentially profound ecological and economic consequences.

4.2.1 Proposed Action.

Vegetation - The areas currently occupied by the buildings under consideration for demolition have been in place for over 40 years. Past activities in these areas have cleared much of the native vegetation from around the buildings. The buildings are surrounded by maintained, mowed lawns, which have been mowed infrequently in the past two years. There are some scattered trees at some of the buildings proposed for demolition but no forested areas that would be impacted by demolition activities. There would be potential short-term impacts to existing ground cover, shrubbery, and small trees located near some of the buildings proposed for demolition. Larger trees located near any of the buildings considered for demolition would be

protected during demolition and earth moving activities and such works would be included in the contracts issued for this project.

Fish and Wildlife - As stated in Section 3.2, a variety of wildlife species occur on Redstone Arsenal. Those species which use open lawns, pastures, and old field habitats, use areas around the buildings for forage/cover/resting habitat. Some suitable nesting/den habitat for small mammals and song birds is also available near the abandoned buildings. Wildlife can move freely near any of the buildings proposed for demolition. However, overall wildlife productivity and diversity around the buildings, proposed for demolition, is limited by the available habitat. Species such as white-tailed deer, rabbit, other small mammals, and red-tailed hawks would typically use these areas. No fishery resources are located near any of the buildings.

There would be the potential for some short-term reduction in wildlife productivity associated with the Proposed Action. However, species diversity is low and the impacts would be of short duration. Vegetative cover would be reestablished and the areas would rapidly recover wildlife values. Therefore, there would be no significant impacts to wildlife resources. In fact, the wildlife values of many areas would be improved by the removal of buildings.

Aquatic Habitats - No significant aquatic habitats were identified near the buildings proposed for demolition. Implementing the Proposed Action would have no measurable direct or indirect impacts on fishery resources.

Threatened and Endangered Species - With one exception, no Federally listed or candidate species occur, nor is suitable habitat available, in the vicinity of buildings proposed for demolition. One Federally listed as threatened species, Price's Potato-Bean (*Apios priceana*), is known to exist in the vicinity of a building that is scheduled to be demolished. Safety precautions will be taken around this building to ensure that no damage is done to this plant during demolition of the building. In addition, the Army will coordinate with the USFWS in order to ensure that no impacts result to the Price's Potato-Bean.

Unique Habitats - The ALNHP has performed extensive surveys for unique habitats and species on RSA (ALNHP, 1995) and has identified several unique habitats. None are close to any of the buildings proposed for demolition. Based on this information it is concluded that the Proposed Action would not impact unique habitat resources at RSA.

4.2.2 No-Action Alternative. There would be no impacts to biological resources under the No-Action Alternative.

4.2.3 Selective Demolition. No impacts to biological resources would be anticipated if the buildings were selectively demolished. Buildings would be demolished by razing, after the ACM has been removed, and the debris taken to RSA's Solid Waste Disposal Facility (SWDF). Precautions to ensure the protection of species of Price's Potato-Bean would occur as detailed in the Threatened and Endangered Species paragraph above.

4.2.4 Mitigation Measures. Demolition contracts would be worded such that trees around buildings proposed for demolition would be protected during demolition activities. The areas would be revegetated with grasses as soon after demolition as practicable to prevent erosion. Eventually some areas would be planted with trees after consultation with the Installation Forester.

4.3 CULTURAL RESOURCES

RSA has recently completed two surveys of structures on the Arsenal. The first, performed by Ms. Kelly Nolte and Mr. Michael V. Taylor of Panamerican Consultants, is *Architectural Assessment of the World War II Military and Civilian Works, U. S. Army Missile Command, Redstone Arsenal, Madison County, Alabama* (Final, March 1997). The second, performed by Ms. Ruth D. Nichols of TRC Mariah Associates, is *An Architectural and Historic Inventory of Buildings and Structures Dating to the Cold War-Era (1946-1989) at Redstone Arsenal, Alabama* (Draft, January 1997). Neither report, in its entirety, has been coordinated with the State Historic Preservation Office (SHPO). The Panamerican WW II Final Report and the Draft TRC Mariah Cold War Report have been sent to the SHPO as supporting documentation for obtaining concurrence on the proposed demolition of the buildings.

The Panamerican Report evaluated structures at RSA using a Category I through IV system which is no longer used by the U. S. Army. These categories will be noted in this EA, although they are no longer in use, because they were the evaluative system utilized by Panamerican. Essentially, Categories I and II are historically significant, and are eligible for the National Register of Historic Places. Categories III and IV are not historically significant, and are not deemed eligible for the National Register. In the absence of any other architectural or historical surveys of World War II and Cold War cultural resources at RSA, these two reports formed the basis for the majority of the analysis contained within this section.

The TRC Mariah Report (January 1997) states that properties that typically failed to yield evidence of "exceptional" significance were excluded from their evaluation. These properties included standard design housing units, fire and police stations, general storage repositories, and support facilities such as sewage lifts, water filtration systems, and heating/cooling facilities. The likelihood that these properties may yield exceptionally significant information achieved within the last 50 years is minimal, as they were utilized for everyday activities and provided routine and non-exceptional support of the Army's Cold War era defense missions. This statement refers to the following buildings: 132, 136, 247, 248, 249, 3434, 3435, 3480, 3490, 3551, 3557, 3565, 3615, 3619, 3624, T-3649, 4197, 4373, 4725, 4730, T-4809, T-4810, T-5655, 5675, 5676, 7115, T-7132, 7846, 7877, 8009, 8011, 8014, and 8020. Of the 35 buildings proposed for demolition, two of them were evaluated for the Cold War era significance.

Building 5451, which was less than 50 years old at the time of the historical survey, does not appear eligible for the National Register. The building does not reflect unique architectural features associated with its use during the Cold War era, and historical research failed to provide evidence that the building was used specifically for missions of *exceptional* Cold War significance related to defense, testing, training, space, intelligence or research and development.

Building 5452, which housed administrative offices at the time of the survey, was converted from World War II laboratory space to serve Cold War era missions. The facility no longer exhibits exceptional historical or architectural significance as an early Cold War era missile and rocket lab/test facility. Because of unavailable written documentation that associated the building directly to early rocket and missile testing, and because of recent renovation into office space that resulted in removal of all original equipment and interior laboratory facilities, the site does not appear eligible for National Register listing.

Most of the other buildings history and evaluations were located within the Panamerican Report.

Building 3490 belongs to Huntsville Arsenal's Plant Area #3, Smoke Munitions Filling (SMF) Plant #1. Plant Area #3 had the mission of filling smoke munitions. Building 3490 was a generic

mixing and blending building that had a simple, large, open floor plan and specialized equipment that could be easily re-calibrated. This building was thus a flexible industrial facility. SMF Plant #1 has been previously assessed by Panamerican Consulting in their *WW II Architectural Assessment of Redstone Arsenal*. The document noted that:

> "...these buildings were easily adapted after WW II to any number of uses from barracks to classrooms to gymnasiums. All of these buildings were made of typical WW II materials and styles as discussed earlier. None of these structures hold any unique or significant role in the WW II history of RSA, the State, or the Nation. The SMF Plant #1 structures should be rated as Army Category IV buildings. The SMF Plant #1 buildings do not qualify for inclusion on the NRHP at this time." (U.S. Army Missile Command, 1997b)

The demolition/destruction of Building 3490 would result in no impacts to cultural resources at RSA.

Buildings 3551, 3557, 3565, 3615, and 3619 belong to Huntsville Arsenal's Plant Area #3, Incendiary Bomb Plant. This plant was responsible for manufacturing and filling incendiary ordnance ranging from thermite hand grenades to air delivered bombs. The Incendiary Bomb Plant has been previously assessed by Panamerican Consulting in their *WW II Architectural Assessment of Redstone Arsenal*. The document noted that:

> "None of these buildings are unique, having all been constructed of traditional WW II materials using WW II industrial plans. The Incendiary Bomb Plant structures should be rated as Army Category IV buildings. The Incendiary Bomb Plant structures do not qualify for inclusion on the NRHP at this time." (U.S. Army Missile Command, 1997b)

The demolition/destruction of Buildings 3551, 3557, 3565, and 3615 would result in no impacts to cultural resources at RSA.

Building 3624 is part of Plant Area #3. This building cannot be assigned readily to a specific smaller plant function but clearly a part of Plant Area #3. This structure is typical of the time and similar buildings are found throughout the base. According to the Panamerican's Report:

> "This structure is not unique and has played no special role in the development of Redstone Arsenal, the State, or the Nation. This structure is currently well maintained and should be rated as a Army Category IV building. The miscellaneous Plant #3 buildings do not qualify for inclusion on the NRHP at this time.

The demolition of building 3624 would result in no impacts to cultural resources on RSA.

Building T-3649 belongs to Huntsville Arsenal's Plant Area #3, SMF Plant #2. Plant Area #3 had the mission of filling smoke munitions. SMF Plant #2 has been previously assessed by Panamerican Consulting in their *WW II Architectural Assessment of Redstone Arsenal*. The document noted that:

> "None of these buildings are unique, having all been constructed of traditional WW II materials using industrial plans of the period. None of these structures hold any unique or significant role in the WW II history of RSA, the State, or the Nation. The SMF Plant #2 structures should be rated as Army Category IV buildings. The SMF Plant #2 buildings do not qualify for inclusion on the NRHP at this time." (U.S. Army Missile Command, 1997b)

The demolition/destruction of Building T-3649 would result in no impacts to cultural resources at RSA.

Building 4725 is a structure typical of the World War II era. This building is located in Plant Area # 1. Today, most of Plant Area # 1 is part of the Marshall Space Flight Center. This building does not hold any unique or significant role in the WW II history of Redstone Arsenal, the State, or the Nation. This building does not qualify for inclusion on the NRHP at this time.

There would be no impact to cultural resources at RSA caused by the demolition/destruction of building 4725.

Building T-4809 is a World War II era temporary wooden building constructed to support Redstone Army Airfield. This building was not assessed in Panamerican's *WW II Architectural Assessment of Redstone Arsenal.* The Department of Defense, the Advisory Council on Historic Preservation (ACHP), and the State Conference of State Historic Preservation Officers signed a Programmatic Agreement (PA) in July, 1986 which addressed the demolition of World War II temporary buildings. This PA stipulated that demolition of this building can proceed, following the completion of a comprehensive HABS/HAER inventory of these structures and its history, which was performed by the Department of Defense.

Buildings 5451 and T-5655 are buildings in Plant Area #2 of the Huntsville Arsenal. Building 5451 was an office and locker room. Building T-5655 was used as an ethylene generator building. A number of buildings could not be assigned to a specific plant function, and are considered to be miscellaneous buildings. According to Panamerican's survey:

> "All of the structures...are typical of military WW II industrial architecture and are found throughout RSA. These structures are not unique and have played no special role in the development of RSA, the state, or the Nation. The structures are currently well maintained and should be rated as Army Category IV buildings. The miscellaneous Plant #2 buildings do not qualify for inclusion on the NRHP at this time." (U.S. Army Missile Command, 1997b)

There would be no impact to cultural resources at RSA caused by the demolition/destruction of Buildings 5451 and T-5655.

Building 5452 was a manufacturing plant building located in Plant Area #2 M-1, on RSA. The M-1 plants produced smoke pots during WW II. The smoke pot was filled with hexachloroethane (HC). HC was regarded as nontoxic, but troop exercises revealed that extreme lung irritation occurred in confined areas. The M-1 plants were made up of screening and weighing buildings, mixing buildings, application building, fill and press structures like building 5452, painting and packing buildings, and chemical buildings, as well as warehouses for raw and finished materials. According to Panamerican's survey:

> "The building in M-1 Plant #2 are of typical WW II materials and styles as discussed earlier. These structures are not unique and have played no special role in the development of Redstone Arsenal, the State, or the Nation. The structures are currently well cared for and should be rated as an Army Category IV buildings. The M-1 Plant #2 buildings do not qualify for inclusion on the NRHP at this time."

Demolition of building 5452 would result in no impacts to cultural resources on RSA

Buildings 5675 and 5676 are located in Huntsville Arsenal, Plant Area #2, CG (Phosgene) Plant. This plant manufactured phosgene, a poisonous gas first used by the Imperial German Army at Verdun in 1916. Phosgene is manufactured by combining chlorine and carbon monoxide in the presence of a catalyst. The plant began production in February 1944 and ended January 1945. This production line was constructed of typical model buildings based upon ones at Edgewood Arsenal, and most of the production line no longer exists. Building 5675, the Carbon Monoxide Manufacturing Plant and Building 5676, the Catalyzer Building, have both been extensively remodeled. Panamerican Consultants stated that:

> "Not enough of production line remains to provide any real information on the manufacturing sequence. The CG plant structures are not distinctly unique structures and have played no special role in the development of RSA, the State, or the Nation. The structures currently are well maintained and should be rated as Army Category IV buildings. The CG plant buildings do not qualify for inclusion on the NRHP at this time." (U.S. Army Missile Command, 1997b)

There would be no impact to cultural resources at RSA caused by the demolition/destruction of Buildings 5675 and 5676.

Building 7115 was a former laundry building located within the warehouse area. Aside from the actual warehouses, the other structure in this area appear to be typical WW II era buildings of construction tiles or wooden clapboards, most with side gable roofs. Today, many of these structures have been obscured by corrugated metal siding and have been connected to each other by a series of elaborate porches, rooms, or other additions. According to the Panamerican's Survey:

> "Many of these structures are of standard military design and offer no unique information architecturally or historically. The structures in this warehouse area, most of which have been sided, are well maintained and actively used. They should be maintained as Army Category IV properties. They are not eligible for the NRHP at this time."

The demolition/destruction of building 7115 would result in no impact to cultural resources at RSA.

Building T-7132 was cleared for demolition in a 1996 MOA among ALSHPO, ACHP, and the Army. There would be no impact to cultural resources at RSA caused by the demolition/destruction of Building T-7132.

Building 8009 and 8014 were a former CWS depot building and a former Police and Fire Station respectively, located in the Administrative Area, Gulf Chemical Warfare Depot (GCWD). A blueprint has been located for this building.

The Panamerican study recommended Building 8014 be classified as a Category III building, and not eligible for the NRHP. The destruction of this building would result in no significant impacts to cultural resources at RSA.

Building 8020 is a World War II era wooden clapboard building constructed within the Inert Warehouse Area. There would be no impact to cultural resources on RSA with the proposed demolition/destruction of this building.

Buildings 3434, 3435, 4373, T-4810, and 7846 have been previously deemed ineligible for the National Register of Historic Places by the U. S. Army Corps of Engineers, Fort Worth District in

An Architectural and Historic Inventory of Buildings and Structures Dating to the Cold War Era (1949-1989) at Redstone Arsenal, Alabama (U.S. Army Corps of Engineers, 1997). The demolition/destruction of these buildings would result in no impacts to cultural resources at RSA.

Demolition/Destruction of the buildings will involve ground disturbance to an approximate depth of six inches, in the immediate vicinity around the involved buildings. Because of extensive ground disturbance that occurred during the construction of these buildings during World War II and the Cold War era, no prehistoric or historic subsurface cultural resources should be affected by this project. There are no known Native American traditional use or religious sites effected by this project.

4.3.1 Proposed Action. There would be no significant impacts expected to cultural resources under the Proposed Action. Demolition of the buildings in question can proceed if the SHPO concurs that the documentation provided to his office is adequate to mitigate any adverse effects to those buildings that the Army and the SHPO agree are eligible for the NRHP.

Demolition/destruction of the following buildings can proceed with no impacts to cultural resources and no mitigations are required:

- Huntsville Arsenal, Plant Area #1, M-1 Plant, Building 4725
- Huntsville Arsenal, Plant Area #2, Building 5451 and T-5655
- Huntsville Arsenal, Plant Area #2, CG (Phosgene) Plant, Buildings 5675 and 5676
- Huntsville Arsenal, Plant Area #2, M-1, Building 5452
- Huntsville Arsenal, Plant Area #3, SMF Plant #1, Building 3490
- Huntsville Arsenal, Plant Area #3, Incendiary Bomb Plant, Buildings 3551, 3557, 3565, 3615, and 3619
- Huntsville Arsenal, Plant Area #3, SMF Plant #2, Building T-3649
- Huntsville Arsenal, Plant Area #3, Building 3624
- Huntsville Arsenal, Huntsville Arsenal Airport, Building T-4809
- Redstone Ordnance Plant, Warehouse Area, Building 7115
- Redstone Ordnance Plant, Administrative Area, Building T-7132
- Gulf Chemical Warfare Depot, Administrative Area, Buildings 8009 and 8014
- Gulf Chemical Warfare Depot, Inert Warehouse Area, Building 8020
- Miscellaneous Cold War era structures, Buildings 3434, 3435, 4373, T-4810, and 7846

need information on bldgs 132, 136, 3480, 4197, 4730, 8011

4.3.2 No-Action Alternative. There would be no negative impacts to cultural resources under the No-Action Alternative, since there are no historic properties involved.

4.3.3 Selective Demolition. This is a viable alternative. There are no historic properties, therefore, there would be no effect to historic properties.

4.3.4 Mitigation Measures.

If government or contractor personnel observe items that might have historical or archaeological significance during borrow area activities, they will report their observations immediately to the Arsenal's Cultural Resources Manager to determine their significance and any special disposition of the finds. Activities in the area of the discovery that may result in the destruction of these resources would cease and personnel would be prevented from trespassing on, removing, or otherwise damaging such resources. These words would be included in the demolition contract.

4.4 HAZARDOUS MATERIALS AND WASTE

4.4.1 Proposed Action. The Proposed Action is to demolish 35 buildings in an environmentally conscientious manner. There would be no significant impacts associated with the Proposed Action. Waste materials generated from the demolition of the selected buildings, once the ACM has been removed, are not considered hazardous. Waste from this action would be produced at two different times. The first waste that would be produced would be from the removal of the ACM. The ACM would be removed in accordance with all Federal, state, and local laws. All of the ACM along with the demolition debris would be disposed of following all applicable laws in the SWDF on Redstone Arsenal. The Arsenal's SWDF permit No. 45-03, issued by ADEM in December 1996, for its construction/demolition landfill (CDL) allows the disposal of up to 300-600 cubic yards per day of only inert materials such as construction and demolition debris, stumps, limbs, concrete, asphalt, asbestos, and similar type waste or material collected from RSA (ADEM 1995). Total capacity is 2,960,000 cubic yards. The CDL would have sufficient capacity to contain the demolition waste produced by the Proposed Action (Personal conversation with Troy Pitts).

4.4.2 No-Action Alternative. If the No-Action Alternative is chosen, it would require that the Army plan no demolition or reconstruction of any of the buildings selected in this Proposed Action. The buildings would remain unchanged, therefore, no impacts from demolition would occur.

4.4.3 Selective Demolition. There would be no impacts due to selective demolition of the proposed buildings, as long as the ACM has been removed from the buildings before demolition proceeds. If none of the buildings selected for demolition contained ACM or lead-based paint, there would be no significant impacts to hazardous materials and waste.

4.4.4 Mitigation Measures. All demolition activities involving buildings containing ACMs will comply with MICOM Regulation 200-1, *Environmental Quality, Asbestos Control Program*, guidance. All ACM would be removed from the building proposed for demolition before demolition proceeds.

4.5 HEALTH AND SAFETY

4.5.1 Proposed Action. No significant environmental impacts to Health and Safety are expected by the demolition of the proposed buildings on RSA. Potential, not significant, impacts to Health and Safety would be minimized by applying safety procedures (which include OSHA regulations 29 CFR Parts 1910 and 1926, AR 385-100, *Safety*, EM 385-1-1, *Army Corps of Engineers Safety and Health Requirements Manual*; and the Base Operating Contractor's approved safety plan) which would be followed during demolition activities. All health and safety requirements of MICOM Regulation 200-1 regarding asbestos work operations will be complied with.

4.5.2 No-Action Alternative. The decision not to demolish the proposed buildings containing asbestos and/or lead-based paint, would potentially have negative impacts on health and safety. Currently, the buildings with potential asbestos and/or lead-based paint issues are located throughout the Arsenal. These areas are unsecured at the present time and there would be potential liability issues should unauthorized persons enter these buildings and be exposed to hazardous materials.

4.5.3 Selective Demolition. Potential negative impacts, as detailed in 4.5.2 above, would be anticipated if the buildings with asbestos and/or lead-based paint were to receive no management attention. This alternative is similar to the Proposed Action alternative. The substantial difference being a closer look at retaining and renovating some of the selected buildings. This would only be a viable alternative if renovations to the selected buildings were determined to be cost effective.

4.5.4 Mitigation Measures. Due to the potential for impacts to health and safety several mitigative measures should be implemented prior to and during demolition activities. These are presented in greater detail in Chapter 5, Conclusions and Mitigations Summary.

4.6 INFRASTRUCTURE AND TRANSPORTATION

4.6.1 Proposed Action. There are no significant impacts anticipated to infrastructure and transportation under the Proposed Action. There would be a significant increase in building debris being taken to the Redstone Sanitary Landfill. However, the landfill has adequate capacity to handle the potential increase in building debris (see Chapter 4, Section 4.4). There are no utility requirements expected for demolition activities. There would also be an increase in vehicular traffic associated with the Proposed Action. The Arsenal's roadway network is expected to provide suitable access between demolition areas and the SWDF.

4.6.2 No-Action Alternative. There are no impacts to infrastructure and transportation with this alternative, since the demolition of the buildings would not occur.

4.6.3 Selective Demolition. There would be no impacts to infrastructure and transportation under the Selective Demolition Alternative. There would be an increase in the amount of building debris taken to the Redstone Sanitary Landfill, as selected buildings are demolished under this alternative. However, the landfill has adequate capacity to handle the potential increase of building demolition debris.

4.6.4 Mitigation Measures. Since no infrastructure and transportation impacts have been identified for the Proposed Action, no mitigation measures are necessary.

4.7 LAND USE

4.7.1 Proposed Action. The Proposed Action would result in positive impacts to land use within the ROI. The most substantial change would be the removal of the buildings proposed for demolition. This would allow the existing land currently occupied by the buildings to be converted to other uses. Demolition of these abandoned buildings would help optimize land use on the Arsenal, consistent with good management practices and long-range planning goals. Another immediate positive impact would be an enhancement of the aesthetics of the area from the removal of the deteriorated structures.

4.7.2 No-Action Alternative. There would be potential negative impacts to land use if the buildings are not demolished. Buildings would have to be maintained and secured to prevent liability issues regarding health and safety. RSA would not have the opportunity to reuse the existing locations where the buildings are located for alternative uses in the near future.

4.7.3 Selective Demolition. The Selective Demolition Alternative would result in positive impacts to land use at RSA. The positive impacts of this alternative are similar to those presented in 4.7.1 above, however, a longer period of time would be required to have the selected buildings demolished, since re-evaluation of some buildings would be necessary.

4.7.4 Mitigation Measures. No mitigation measures are anticipated for land use.

4.8 NOISE

4.8.1 Proposed Action. There would be no significant impacts anticipated from noise due to demolition activities. Normal demolition and earthmoving equipment operations would generate noise only during demolition activities, and would be of limited duration. Current building locations are not adjacent to sensitive noise receptors (such as endangered species, hospitals, and schools). Buildings 4809 and 4810 are located in ICUZ Zone III of the Arsenal adjacent to the Redstone Army Airfield which typically receives the highest amounts of noise related impacts. However, the limited duration of the Proposed Action in these locations and the normal ambient noise that occurs in this area would cause no significant additional noise impacts. The noise produced from these activities are anticipated to be similar to that of normal construction noise levels, see Table 3-4.

TABLE 3-4. Typical Construction Equipment Noise Levels
Noise Levels are in dBA @ 50 Feet

Equipment	Noise Level (decibels)
Bulldozer	80
Front end loader	72-84
Dump truck	83-94
Jack hammer	81-98
Crane with ball	75-87
Backhoe	72-93
Scraper	80-93
Grader	80-93
Roller	73-95
Paver	86-88

Source: U.S. Air Force, 1996

4.8.2 No Action Alternative. There would be no anticipated impacts from noise under this alternative, since no demolition activities would occur.

4.8.3 Selective Demolition. There would be no significant impacts from the Selective Demolition Alternative. Normal demolition and earthmoving equipment would generate noise only during demolition activities, and would be of limited duration.

4.8.4 Mitigation Measures. Since no significant noise impacts have been identified under the Proposed Action, no mitigation measures are necessary.

4.9 GEOLOGY AND SOILS

4.9.1 Proposed Action. There would be no significant impacts anticipated to geology or soils from the Proposed Action. Best management practices for erosion control, topsoil management and revegetation would be required and stated in the demolition contract. Siltation barriers would also be required during demolition and soil/debris removal.

4.9.2 No-Action Alternative. There would be no impacts to geology or soils anticipated from the No-Action Alternative as long as the identified buildings remain intact.

4.9.3 Selective Demolition. There would be no significant impacts to geology or soils from the Selective Demolition Alternative. Mitigation measures, which are detailed in Section 5.9, would be followed.

4.9.4 Mitigation Measures. Erosion control measures including topsoil management and revegetation of areas that are disturbed would be required. Siltation barriers around the buildings during demolition activities would also be required and would be stated in the demolition contract.

4.10 SOCIOECONOMICS

4.10.1 Proposed Action. The Proposed Action would have a positive impact, though not significant impact on local socioeconomics, from the employment generated from the Proposed Action. The buildings are currently abandoned and contribute nothing to socioeconomics. Incidental positive impacts to socioeconomics associated with future construction projects would be expected and evaluated under the environmental documentation for those projects.

4.10.2 No-Action Alternative. There would no socioeconomic impacts anticipated if the buildings are not demolished.

4.10.3 Selective Demolition. There would be potential positive impacts anticipated to local socioeconomics, similar to those mentioned in Section 4.10.1

4.10.4 Mitigation Measures. Since only positive socioeconomic impacts have been identified for the Proposed Action, no mitigation measures are anticipated.

4.11 WATER RESOURCES

4.11.1 Proposed Action. There would be potential for impacts, though not significant, to water resources due to demolition of buildings under the Proposed Action. Soils disturbed during demolition activities could possibly be washed into drainage ditches and, potentially, into RSA watercourses. Erosion control during demolition activities would be undertaken with the use of hay bales and silt fencing to prevent the movement of soils via surface waters. These procedures would be addressed in the demolition contract.

4.11.2 No-Action Alternative. If the No-Action Alternative were chosen, no demolition would take place and the existing buildings would remain as they are at present. The buildings would remain in place and threats to water resources would not occur as long as the buildings remain intact.

4.11.3 Selective Demolition. There would be potential, though not significant, impacts to water resources from the demolition of selected buildings at RSA under the Selective Demolition Alternative. Potentially contaminated soils could be washed into drainage ditches or creeks adjacent to the buildings proposed for demolition. Erosion control measures would reduce the potential impacts. These procedures would be addressed in the demolition contract.

4.11.4 Mitigation Measures. Under the Proposed Action or the Selective Demolition Alternative, erosion control methods will be used to prevent surface erosion sediments from

entering any of the drainage ditches near any of the buildings. Siltation barriers placed prior to demolition activities would be required to minimize any such runoff. These procedures would be addressed in the demolition contract.

5.0 CONCLUSIONS AND MITIGATIONS SUMMARY

RSA proposes to demolish 35 World War II and Cold War era buildings in an environmentally conscious, consistent and effective manner. These buildings have outlived their usefulness and are in excess of Army needs. Some of the buildings contain asbestos and/or lead-based paint. The purpose of this EA was to examine the potential environmental impacts that would reasonably be anticipated if the Proposed Action were undertaken. This document would also assist in tiering future environmental documents, such as Records of Environmental Consideration (RECs), if additional buildings for demolition are identified.

No significant impacts to any of the resources examined in this EA are anticipated from implementing the Proposed Action or the Selective Demolition Alternative. There would be positive impacts anticipated to biological resources and land use as a result of using good management practices and long-range planning as described under the Proposed Action or the Selective Demolition Alternative. A short-term positive impact to socioeconomics would also be anticipated from employment opportunities derived from implementing the Proposed Action or the Selective Demolition Alternative.

Under the No-Action Alternative, the RSA would not demolish the identified buildings and they would remain in place. If this alternative is chosen the buildings would need to be maintained and secured to prevent unauthorized personnel from entering. The No-Action Alternative was not chosen, since potential negative impacts would be expected in several areas of environmental consideration. There would be potentially negative impacts to land use in the areas where the buildings are currently located if the land cannot be utilized productively. In addition, there would be potential negative impacts to health and safety from the asbestos and/or lead-based paint suspected to exist in the buildings should they be left in place with no security.

There are two important conclusions based on the evaluation in this EA. One is that conducting demolition activities on the buildings would appear to optimize planning control over land use and consequently ensure the most environmentally sound planning practices are followed. Secondly, removal of the buildings would remove potential health and safety risk issues to accommodate broad environmental and land management concerns on the Arsenal and in the surrounding area.

5.1 AIR QUALITY

Mitigative measures for this resource are that demolition activities will be performed on a scheduled basis following established SOPs as to not exceed Federal and state NAAQS concentrations. Heavy equipment vehicles would be equipped with standard pollution control devices to minimize air quality impacts. Soil and demolition debris around the demolition site would be kept wet in order to keep the level of fugitive dust (particulate matter) down.

5.2 BIOLOGICAL RESOURCES

Mitigative measures for this resource would require that the Arsenal would not remove large trees from around building demolition areas. The areas from which buildings are removed would be revegetated with grasses as soon after demolition as practicable to prevent erosion. Revegetation/reforestation would follow as soon as feasible, based on consultation with the Arsenal Forester. Wording in the demolition contract would ensure that these mitigations are accomplished.

5.3 CULTURAL RESOURCES

Mitigative measures for cultural resources are as follows:

There are no mitigative measures required for the 35 buildings proposed to be demolished since ALSHPO has concurred with RSA's determination that they are not eligible for the National Register of Historic Places.

If government or contractor personnel observe items that might have historical or archaeological significance during borrow area activities, they will report their observations immediately to the Arsenal's Cultural Resources Manager to determine their significance and any special disposition of the finds. Activities in the area of the discovery that may result in the destruction of these resources would cease, the Installation Cultural Resources Manager would be notified, and personnel would be prevented from trespassing on, removing, or otherwise damaging such resources. These words would be included in the demolition contract.

5.4 HAZARDOUS MATERIALS AND WASTE

Mitigative measures for this area are as follows:

Removal of ACM would be in accordance with Federal, state, and local regulations and procedures. ACM being transported to the CDL would be contained such that no ACM fibers escape into the environment.

5.5 HEALTH AND SAFETY

The following mitigation measures are recommended for the area of Health and Safety.

5.5.1 Hazards

The contractor shall address the following potential hazards that may be encountered during site work.

- Physical, and safety hazards of concern for each site task and/or operation to be performed. A hazard/risk analysis should be performed and added to the Site Safety and Health Plan (SSHP).

- Pathways (downwind hazards) for hazardous substance disposition.

- Exposure to residues from asbestos, silica, dust, lead, and PCBs.

- Collection and onsite treatment of wastewater generated by any decontamination processes would be collected and disposed of by RSA approved disposal regulations.

5.6 INFRASTRUCTURE AND TRANSPORTATION

No mitigative measures have been identified or are necessary for this area.

5.7 LAND USE

No mitigative measures have been identified or are necessary for this area.

5.8 NOISE

No mitigative measures have been identified or are necessary for this area.

5.9 GEOLOGY AND SOILS

The only mitigation measure identified for these resources was for soils. The contractor will remove some soil with treatment and demolition debris. This will ensure the complete removal of asbestos and/or lead-based paint residues. The Army will revegetate all demolition areas with native grasses when demolition activities are completed on individual sites. Such wording will be included in the demolition contract.

5.10 SOCIOECONOMICS

No mitigative measures have been identified or are necessary for this area.

5.11 WATER RESOURCES

Mitigative measures for this resource includes erosion control techniques to prevent soil erosion and minimize runoff of material from demolition areas. Siltation barriers will be erected prior to demolition activities where slopes could result in rapid runoff. Sites would be vegetated following demolition activities. Such wording will be included in the demolition contract.

5.12 CUMULATIVE IMPACTS

In accordance with the implementing regulations for the National Environmental Policy Act (40 CFR 1508.7), cumulative impacts must be addressed in an EA. A cumulative impact is the "…impact on the environment which results from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions…"

The activities described for this demolition project would be accomplished in isolation. Based on the review of existing environmental documentation examined for this EA, and discussions of potential future activities planned for RSA, cumulative impacts would not be anticipated.

5.13 INDIVIDUALS/ORGANIZATIONS RESPONSIBLE FOR OBTAINING REQUIRED PERMITS/LICENSES/ENTITLEMENTS

All required permits and licenses necessary to conduct this Proposed Action would be obtained by the selected demolition contractor.

5.14 CONFLICTS WITH FEDERAL. STATE, OR LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

The Proposed Action itself would have no impact on existing land use itself and presents no known conflicts with Federal, regional, state, or local land use plans, policies, or controls**.**

5.15 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Anticipated energy demands for program activities can be accommodated**.**

5.16 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL

Other than fuels used during demolition activities, no significant use of natural or depletable resources are anticipated. Equipment and materials recovered during demolition activities may be reused or recycled.

5.17 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

The Proposed Action would result in no permanent loss of habitats for plants and animals, no loss or impact on threatened or endangered species, and no loss of cultural resources such as archaeological or historic sites. There would be no permanent changes in land use or preclusion of development of any potential mineral resources. No irreversible or irretrievable commitment of resources has been identified.

5.18 ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

There are no adverse environmental effects caused by the Proposed Action that cannot be avoided.

5.19 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The productivity and future usage of the land would be improved by the demolition of vacant buildings. The land would be returned to either a more natural state or for use for other RSA activities.

5.20 FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS AND LOW-INCOME POPULATIONS

The Proposed Action would be undertaken in a manner that would not substantially affect human health or the environment. The Proposed Action would also be conducted in a manner that would not exclude persons from participation in, deny persons the benefits of, or subject persons to discrimination under, the program actions because of their race, color, or national origin.

5.21 CONDITIONS NORMALLY REQUIRING AN ENVIRONMENTAL IMPACT STATEMENT

The potential impacts arising from the Demolition of Buildings on Redstone Arsenal were evaluated specifically in the context of the criteria for actions requiring an Environmental Impact Statement, described in DOD Directive 6050.1, Environmental Effects in the United States of Department of Defense Actions (U.S. Department of Defense 1979), and AR 200-2, Environmental Effects of Army Actions (U.S. Department of the Army 1988).

Specifically, the proposed project activities were evaluated for their potential to:

- significantly affect environmental quality or public health and safety;
- significantly affect historic or archaeological resources, public parks and recreation areas, wildlife refuge or wilderness areas, wild and scenic rivers, or aquifers;
- adversely affect properties listed or meeting the criteria for listing on the National Register or the National Registry of National Landmarks;

- significantly affect prime and unique farmlands, wetlands, ecologically or culturally important areas, or other areas of unique or critical environmental concern;
- result in significant and uncertain environmental effects or unique or unknown environmental risks;
- significantly affect a species or habitat listed or proposed for listing on the Federal list of endangered or threatened species;
- establish a precedent for future actions;
- adversely interact with other actions resulting in cumulative environmental effects; and
- involve the use, transportation, storage, and disposal of hazardous or toxic materials that may have significant environmental impact.

No conditions were discovered during the analysis of this Proposed Action that would necessitate an environmental impact statement.

5.22 PUBLIC INVOLVEMENT

There is a 30-day comment period after the Notice of Availability of The Environmental Assessment for the Demolition of Buildings and Structures on Redstone Arsenal, Alabama is published in the local newspaper. Other Federal, state, and local agencies are not currently involved in the planning of this action.

There were no significant environmental issues determined through this EA process. All issues raised during the scope of the process have been identified within this assessment.

6.0 LIST OF PREPARERS

Sharon Belser
Environmental Engineer
CH2M HILL
B.S., Civil Engineering, Auburn University, 1993

Larry W. Blackwell
Director, Environmental Programs
Vista Technologies Inc.
M.A., Human Relations, Louisiana Tech University, 1988
BFA, Advertising, Louisiana Tech University, 1971

Matthew M. Estes
Environmental Scientist
Vista Technologies Inc.
B.S., Environmental Science, University of California, Riverside, 1991

Bob Fay
ISSI Corporation

Kathy Guelde
Environmental Engineer
Vista Technologies Inc.
B.S., Environmental Engineering, University of Findlay, 1995

Jeffery H. Scott, Ph.D.
Senior Fish and Wildlife Biologist
Vista Technologies Inc.
Ph.D., Aquatic Ecology/Limnology, Auburn University, 1990
M.S., Biology, Jacksonville State University, 1982
B.S., Biology, Jacksonville State University, 1977

7.0 INDIVIDUALS/AGENCIES CONSULTED

7.1 AGENCIES/ORGANIZATIONS SENT COPIES OF THE ASSESSMENT

As part of the CEQ Regulations on the National Environmental Policy Act, the U.S. Army Aviation and Missile Command is circulating the Environmental Assessment for the Demolition of 85 Buildings on RSA to the following agencies, organizations, and individuals:

Alabama State Historic Preservation Office, Montgomery, Alabama

7.2 INDIVIDUALS AND AGENCIES CONTRIBUTING TO THE PROJECT

Mark Burroughs, Master Planning, U.S. Army Aviation and Missile Command Environmental Office, Redstone Arsenal, Alabama

Daniel J. Dunn, Environmental Protection Specialist, U.S. Army Aviation and Missile Command Environmental Office, Redstone Arsenal, Alabama

Lawrence F. Oaks, Alabama State Historical Preservation Office, Montgomery, Alabama

Troy Pitts, Landfill Manager, U.S. Army Aviation and Missile Command Environmental Office, Redstone Arsenal, Alabama

Carolene Wu, Cultural Resources Manager and NEPA Coordinator, U.S. Army Aviation and Missile Command Environmental Office, Redstone Arsenal, Alabama

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